09-03-19 08-05-19 08-05-19

Student: _____ **Instructor:** Alfredo Alvarez **Assignment:** 09-05-19
Date: _____ **Course:** math1314newcoreq2019 finalm1314COC0147sullljjRZ

1. Evaluate.

-2^2

$-2^2 =$ _____

Answer: -4

ID: Quick Check R.4.7

$-2^2 =$
$-(2)(2) =$
$-(4) =$
$-4 =$

PEMDAS

2. Evaluate the expression.

$4 + 2 \cdot (10 - 3)$

$4 + 2 \cdot (10 - 3) =$ _____

Answer: 18

ID: R.4.43

$4 + 2 \cdot (10 - 3) =$
$4 + 2(7) =$
$4 + 14 =$
$18 =$

PEMDAS

3. Simplify.

$-5[6 - (2 - 4)]$

$-5[6 - (2 - 4)] =$ _____

Answer: -40

ID: R.4.45

$-5[6 - (2-4)] =$
$-5[6 - (-2)] =$
$-5[6 + 2] =$
$-5[8] =$
$-40 =$

PEMDAS

4. Evaluate the expression.

$\frac{4 - (-8)}{2}$

$\frac{4 - (-8)}{2} =$ _____ (Type an integer or a simplified fraction.)

Answer: 6

ID: R.4.47

$\frac{4 - (-8)}{2} =$
$\frac{4 + 8}{2} =$
$\frac{12}{2} =$
$6 =$

PEMDAS

5. Evaluate the expression.

$3 \cdot [4 + 3 \cdot (4 + 5)]$

$3 \cdot [4 + 3 \cdot (4 + 5)] =$ _____ (Simplify your answer.)

Answer: 93

ID: R.4.53

$3 \cdot [4 + 3 \cdot (4+5)] =$
$3 \cdot [4 + 3(9)] =$
$3 \cdot [4 + 27] =$
$3 \cdot [31] =$
$93 =$
PEMDAS

6. Simplify the following expression by combining like terms.

$3(z + 7) - 2(6z + 1)$

$3(z + 7) - 2(6z + 1) =$ _____ (Simplify your answer. Do not factor.)

Answer: $-9z + 19$

ID: Quick Check R.5.27

$3(z+7) - 2(6z+1) =$
$3z + 21 - 12z - 2 =$
$-9z + 19 =$
PEMDAS

7. Evaluate the following expression for the value given.

$-2x^2 + 4x - 8;\ x = -4$

The expression $-2x^2 + 4x - 8$ evaluated when $x = -4$ is _____. (Type an integer.)

Answer: -56

ID: R.5.49

PEMDAS
$-2x^2 + 4x - 8 =$
$-2(-4)^2 + 4(-4) - 8 =$
$-2(-4)(-4) + 4(-4) - 8 =$
$-2(16) + 4(-4) - 8 =$
$-32 - 16 - 8 =$
$-56 =$

8. Simplify by factoring.

$\sqrt{75}$

Answer: $5\sqrt{3}$

ID: Quick Check R.6.25

$\sqrt{75} =$ _____
(Type an exact answer, using radicals as needed.)

Primes 2, 3, 5, 7, 11, ...

$\sqrt{75} =$
$\sqrt{25 \cdot 3} =$
$\sqrt{25}\sqrt{3} =$
$5\sqrt{3} =$

3 | 75
5 | 25
5 | 5
1

9. Simplify by adding the polynomials.

$(2x^2 - 2x + 6) + (7x^2 + 13x - 20)$

$(2x^2 - 2x + 6) + (7x^2 + 13x - 20) =$ _____

(Simpify your answer. Do not factor.)

Answer: $9x^2 + 11x - 14$

ID: Quick Check R.9.18

10. Simplify the following by subtracting the polynomials.

$(7y^3 - 4y^2 + y + 9) - (3y^3 + 9y^2 - 5y + 3)$

$(7y^3 - 4y^2 + y + 9) - (3y^3 + 9y^2 - 5y + 3) =$ _____ (Do not factor.)

Answer: $4y^3 - 13y^2 + 6y + 6$

ID: Quick Check R.9.22

11. Simplify.

$(10y^3 - 8y^2 + 3y + 5) - (-y^3 + 7y + 9)$

$(10y^3 - 8y^2 + 3y + 5) - (-y^3 + 7y + 9) =$ _____ (Do not factor)

Answer: $11y^3 - 8y^2 - 4y - 4$

ID: Quick Check R.9.23

12. Multiply and simplify the expressions.

$7x(x^2 + 3x + 6)$

$7x(x^2 + 3x + 6) =$ _____ (Simplify your answer.)

Answer: $7x^3 + 21x^2 + 42x$

ID: Quick Check R.10.5

13. Find the product of the two binomials.

(x + 6)(x + 4)

(x + 6)(x + 4) = ____ (Simplify your answer.)

Answer: $x^2 + 10x + 24$

$(x+6)(x+4) =$
$x^2 + 4x + 6x + 24 =$
$x^2 + 10x + 24 =$

ID: Quick Check R.10.9

14. Use the FOIL method to find the product.

(3x + 8)(4x − 1)

(3x + 8)(4x − 1) = ____ (Simplify your answer.)

Answer: $12x^2 + 29x - 8$

$(3x+8)(4x-1) =$
$12x^2 - 3x + 32x - 8 =$
$12x^2 + 29x - 8 =$

ID: Quick Check R.10.10

15. Find the product.

(6a − b)(a + 5b)

(6a − b)(a + 5b) = ____

Answer: $6a^2 + 29ab - 5b^2$

$(6a-b)(a+5b) =$
$6a^2 + 30ab - ab - 5b^2 =$
$6a^2 + 29ab - 5b^2 =$

ID: Quick Check R.10.11

16. Find the product using the difference of two squares formula.

(4x + 5)(4x − 5)

(4x + 5)(4x − 5) = ____

Answer: $16x^2 - 25$

$(4x+5)(4x-5) =$
$16x^2 - 20x + 20x - 25 =$
$16x^2 - 25 =$

ID: Quick Check R.10.16

17. Multiply using the rule for the square of a binomial.

$(x-8)^2$

$(x-8)^2 =$ ____

Answer: $x^2 - 16x + 64$

$(x-8)^2 =$
$(x-8)(x-8) =$
$x^2 - 8x - 8x + 64 =$
$x^2 - 16x + 64 =$

ID: Quick Check R.10.21

18. Find the product.

$(7x+3)^2$

$(7x+3)^2 =$ ____

Answer: $49x^2 + 42x + 9$

$(7x+3)^2 =$
$(7x+3)(7x+3) =$
$49x^2 + 21x + 21x + 9 =$
$49x^2 + 42x + 9 =$

ID: Quick Check R.10.22

19. Find the product.

$(x+7)(x-5)$

$(x+7)(x-5) =$ ____ (Simplify your answer.)

Answer: $x^2 + 2x - 35$

$(x+7)(x-5) =$
$x^2 - 5x + 7x - 35 =$
$x^2 + 2x - 35 =$

ID: R.10.37

20. Use the FOIL method to find the product.

$(4x+7)(4x-1)$

$(4x+7)(4x-1) =$ ____ (Simplify your answer.)

Answer: $16x^2 + 24x - 7$

$(4x+7)(4x-1) =$
$16x^2 - 4x + 28x - 7 =$
$16x^2 + 24x - 7 =$

ID: R.10.39

21. Find the product of the two binomials.

(5a + 3b)(a − 4b)

(5a + 3b)(a − 4b) = _____ (Simplify your answer.)

Answer: $5a^2 - 17ab - 12b^2$

ID: R.10.45

$(5a+3b)(a-4b) =$
$5a^2 - 20ab + 3ab - 12b^2 =$
$5a^2 - 17ab - 12b^2 =$

22. Find the product of the polynomials.

$(x + 8)(x^2 + 2x + 5)$

$(x + 8)(x^2 + 2x + 5)$ = _____ (Simplify your answer.)

Answer: $x^3 + 10x^2 + 21x + 40$

ID: R.10.49

$(x+8)(x^2+2x+5) =$
$x^3 + 2x^2 + 5x + 8x^2 + 16x + 40 =$
$x^3 + 10x^2 + 21x + 40 =$

23. Find the product of the polynomials.

$(5x^2 + 4x + 5)(2x + 3)$

$(5x^2 + 4x + 5)(2x + 3)$ = _____

Answer: $10x^3 + 23x^2 + 22x + 15$

ID: R.10.53

$(5x^2+4x+5)(2x+3) =$
$10x^3 + 15x^2 + 8x^2 + 12x + 10x + 15 =$
$10x^3 + 23x^2 + 22x + 15 =$

24. Find the product.

(b + 2)(b − 3)(b − 2)

(b + 2)(b − 3)(b − 2) = _____

Answer: $b^3 - 3b^2 - 4b + 12$

ID: R.10.61

$(b+2)(b-3)(b-2) =$
$(b+2)(b^2 - 2b - 3b + 6) =$
$(b+2)(b^2 - 5b + 6) =$
$b^3 - 5b^2 + 6b + 2b^2 - 10b + 12 =$
$b^3 - 3b^2 - 4b + 12 =$

25. Simplify the expression.

$(y-5)^3$

$(y-5)^3 =$ ____

Answer: $y^3 - 15y^2 + 75y - 125$

$(y-5)^3 =$
$(y-5)(y-5)(y-5) =$
$(y-5)(y^2 - 5y - 5y + 25) =$
$(y-5)(y^2 - 10y + 25) =$
$y^3 - 10y^2 + 25y - 5y^2 + 50y - 125 =$
$y^3 - 15y^2 + 75y - 125 =$

ID: R.10.93

26. Determine which of the given numbers are solutions to the equation.

$-8x + 2 = -6$; $x = -4$, $x = 1$, $x = 4$

Is $x = -4$ a solution to the equation?

- Yes
- No

$-8x+2 = -6$
$-8(-4)+2 = -6$
$32+2 = -6$
$34 \neq -6$ NO

Is $x = 1$ a solution to the equation?

- No
- Yes

$-8x+2 = -6$
$-8(1)+2 = -6$
$-8+2 = -6$
$-6 = -6$ YES

Is $x = 4$ a solution to the equation?

- No
- Yes

$-8x+2 = -6$
$-8(4)+2 = -6$
$-32+2 = -6$
$-30 \neq -6$ NO

Answers No

Yes

No

ID: Quick Check PF.1.3

27. Solve the following equation.

$3x + 4 = 16$

$3x+4 = 16$
$3x+4-4 = 16-4$
$3x = 12$
$\frac{3x}{3} = \frac{12}{3}$
$x = 4$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The solution set is { ____ }. (Type an integer or a simplified fraction.)
- **B.** The solution is all real numbers.
- **C.** The solution is the empty set.

Answer: A. The solution set is { 4 }. (Type an integer or a simplified fraction.)

ID: Quick Check PF.1.8

28. Solve the following equation and verify your solution.

$-3x - 8 = 13$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }. (Simplify your answer.)
- B. The solution is all real numbers.
- C. The solution is the empty set.

Answer: A. The solution set is {−7}. (Simplify your answer.)

ID: Quick Check PF.1.9

29. Solve the following linear equation and verify the solution.

$2x + 2 + 5x + 4 = 5x + 14$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }. (Type an integer or a simplified fraction.)
- B. The solution is all real numbers.
- C. The solution is the empty set.

Answer: A. The solution set is {4}. (Type an integer or a simplified fraction.)

ID: Quick Check PF.1.11

30. Solve the following linear equation.

$5(x - 3) = 15$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }. (Type an integer or a simplified fraction.)
- B. The solution is all real numbers.
- C. The solution is the empty set.

Answer: A. The solution set is {6}. (Type an integer or a simplified fraction.)

ID: Quick Check PF.1.14

31. Solve the following linear equation and verify the solution.

$-3(x-2)-2=5(x+3)+37$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }. (Simplify your answer.)
- B. The solution is all real numbers.
- C. The solution is the empty set.

Answer: A. The solution set is { −6 }. (Simplify your answer.)

ID: Quick Check PF.1.15

$-3(x-2)-2=5(x+3)+37$
$-3x+6-2=5x+15+37$
$-3x+4=5x+52$
$-3x+4-4=5x+52-4$
$-3x=5x+48$
$-3x-5x=5x+48-5x$
$-8x=48$
$\frac{-8x}{-8}=\frac{48}{-8}$
$x=-6$

32. Solve the following linear equation. Be sure to verify your solution.

$0.06x-1.9=0.02x-1.1$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }. (Type an integer or a decimal.)
- B. The solution is all real numbers.
- C. The solution is the empty set.

Answer: A. The solution set is { 20 }.(Type an integer or a decimal.)

ID: Quick Check PF.1.23

$0.06x-1.9=0.02x-1.1$
$0.06x-1.9+1.9=0.02x-1.1+1.9$
$0.06x=0.02x+.8$
$0.06x-0.02x=0.02x+.8-0.02x$
$0.04x=.8$
$\frac{0.04x}{0.04}=\frac{.8}{0.04}$
$x=20$

33. Solve the following linear equation. Identify the equation as an identity, contradiction, or conditional equation.

$2(x + 9) = 2x + 9$

$2(x+9) = 2x+9$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

$2x + 18 = 2x + 9$

- A. The solution set is { }. (Type an integer or a simplified fraction.)
- B. The solution is all real numbers.
- C. The solution is the empty set.

$2x + 18 - 18 = 2x + 9 - 18$

$2x = 2x - 9$

State whether the equation is an identity, contradiction, or conditional equation.

$2x - 2x = 2x - 9 - 2x$

- Identity
- Contradiction
- Conditional equation

$0 \neq -9$

Answers C. The solution is the empty set.

Contradiction

The solution is the empty set.

Contradiction

ID: Quick Check PF.1.27

34. Solve the following equation and state whether it is an identity, a contradiction, or a conditional equation.

$4(x - 2) = 3x - 8 + x$

$4(x-2) = 3x - 8 + x$

$4x - 8 = 4x - 8$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

$4x - 8 + 8 = 4x - 8 + 8$

$4x = 4x$

$4x - 4x = 4x - 4x$

$0 = 0$

- A. The solution set is { }. (Type an integer or a simplified fraction.)
- B. The solution is all real numbers.
- C. The solution is the empty set or Ø.

State whether the equation is an identity, contradiction, or conditional equation. Choose the correct choice below.

- identity
- contradiction
- conditional equation

The solution is all real numbers.

Identity

Answers B. The solution is all real numbers.

identity

ID: Quick Check PF.1.28

35. Solve the following equation.

$6x + 3 = 21$

$6x+3=21$
$6x+3-3=21-3$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

$6x=18$

- A. The solution set is { } . (Type an integer or a simplified fraction.)
- B. The solution is all real numbers.
- C. The solution is the empty set.

$\frac{6x}{6}=\frac{18}{6}$

Answer: A. The solution set is { 3 } . (Type an integer or a simplified fraction.)

$x=3$

ID: PF.1.43

36. Solve the following linear equation.

$5z + 6 = 2$

$5z+6=2$
$5z+6-6=2-6$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

$5z=-4$

- A. The solution set is { } . (Type an integer or a simplified fraction.)
- B. The solution is all real numbers.
- C. The solution is the empty set.

$\frac{5z}{5}=\frac{-4}{5}$

Answer: A. The solution set is $\left\{-\frac{4}{5}\right\}$. (Type an integer or a simplified fraction.)

$z=\frac{-4}{5}$

ID: PF.1.45

37. Solve the following linear equation.

$-9w + 8w + 4 = -6$

$-9w+8w+4=-6$
$-1w+4=-6$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

$-1w+4-4=-6-4$

- A. The solution set is { } . (Type an integer or a simplified fraction.)
- B. The solution is all real numbers.
- C. The solution is the empty set.

$-1w=-10$

$\frac{-1w}{-1}=\frac{-10}{-1}$

Answer: A. The solution set is { 10 } . (Type an integer or a simplified fraction.)

$w=10$

ID: PF.1.47

38. Solve the following linear equation.

$2(x+2) = -2$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { } . (Type an integer or a simplified fraction.)
- B. The solution is all real numbers.
- C. The solution is the empty set.

Answer: A. The solution set is {−3}. (Type an integer or a simplified fraction.)

ID: PF.1.51

39. Solve the following linear equation.

$\frac{2y}{9} - \frac{10}{63} = \frac{y}{7}$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { } . (Type an integer or a simplified fraction.)
- B. The solution is all real numbers.
- C. The solution is the empty set.

Answer: A. The solution set is {2}. (Type an integer or a simplified fraction.)

ID: PF.1.53

40. Solve for y.

$7x + y = 21$

$y =$ ____

Answer: $-7x + 21$

ID: PF.1.87

41. Solve the equation for y.

$7x + 3y = 13$

$y =$ [ ] (Simplify your answer.)

Answer: $-\frac{7}{3}x + \frac{13}{3}$

ID: PF.1.89

$7x+3y=13$

$7x+3y-7x=13-7x$

$3y=13-7x$

$\frac{3y}{3}=\frac{13}{3}-\frac{7x}{3}$

$y=\frac{13}{3}-\frac{7x}{3}$ $\quad y=-\frac{7x}{3}+\frac{13}{3}$

42. Solve the quadratic equation by completing the square.

$x^2 + 4x = 5$

The solution set is { [ ] }.
(Simplify your answer, including any radicals and i as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

Answer: 1, − 5

ID: PF.5.15

$x^2+4x+(\frac{1}{2}(4))^2=5+(\frac{1}{2}(4))^2$

$x^2+4x+(2)^2=5+(2)^2$

$x^2+4x+4=5+4$

$x^2+4x+4=9$

$(x+2)(x+2)=9$

$(x+2)^2=9$

$\sqrt{(x+2)^2}=\pm\sqrt{9}$

$x+2=\pm 3$

$x+2=-3$

$x+2-2=-3-2$

$x=-5$

$x+2=3$

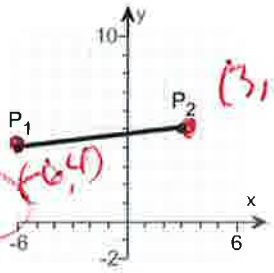
$x+2-2=3-2$

$x=1$

43. Find the distance $d(P_1, P_2)$ between the given points P_1 and P_2.

$P_1 = (-6,4)$

$P_2 = (3,5)$



$d(P_1, P_2) =$ [ ]
(Simplify your answer. Type an exact answer, using radicals as needed.)

Answer: $\sqrt{82}$

ID: F.1.21

$(-6,4)$ $(3,5)$ $(3,5)$

$x_1\ y_1$ $x_2\ y_2$

formula $d=\sqrt{(x_1-x_2)^2+(y_1-y_2)^2}$

$d=\sqrt{((-6)-(3))^2+((4)-(5))^2}$

$d=\sqrt{(-6-3)^2+(4-5)^2}$

$d=\sqrt{(-9)^2+(-1)^2}$

$d=\sqrt{81+1}$

$d=\sqrt{82}$

formula

44. Find the midpoint of the line segment joining the points P_1 and P_2.

$P_1 = (3, -6)$; $P_2 = (9, 8)$

The midpoint of the line segment joining the points P_1 and P_2 is [ ].
(Simplify your answer. Type an ordered pair.)

Answer: (6,1)

ID: F.1.39

45. Solve the following equation.

$17 = 1 + 4(x - 19)$

The solution set is { }.

Answer: 23

ID: F.2.1

46. Solve the equation by factoring.

$z^2 + z - 6 = 0$

What is the solution set?

{ } (Use a comma to separate answers as needed.)

Answer: $-3, 2$

ID: F.2.2

47.

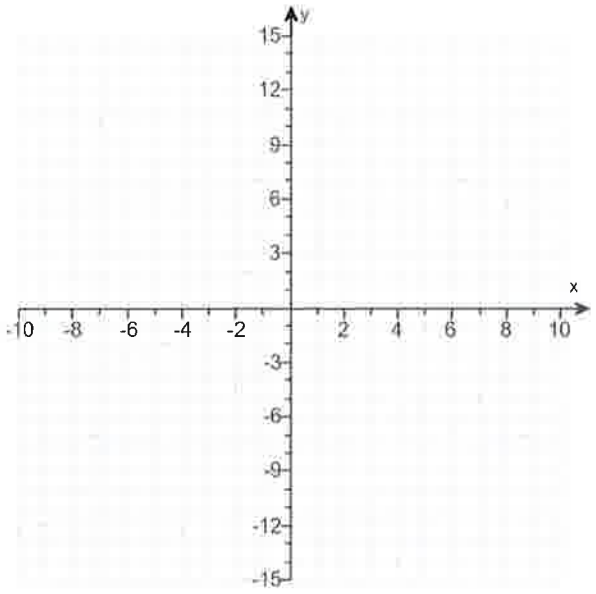
Find the intercepts and use them to graph the equation.

$y = 2x + 4$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The intercept(s) is/are _____. (Type an ordered pair. Use a comma to separate answers as needed.)
- **B.** There are no intercepts.

Use the graphing tool to graph the equation. Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.



$y = 2x + 4$

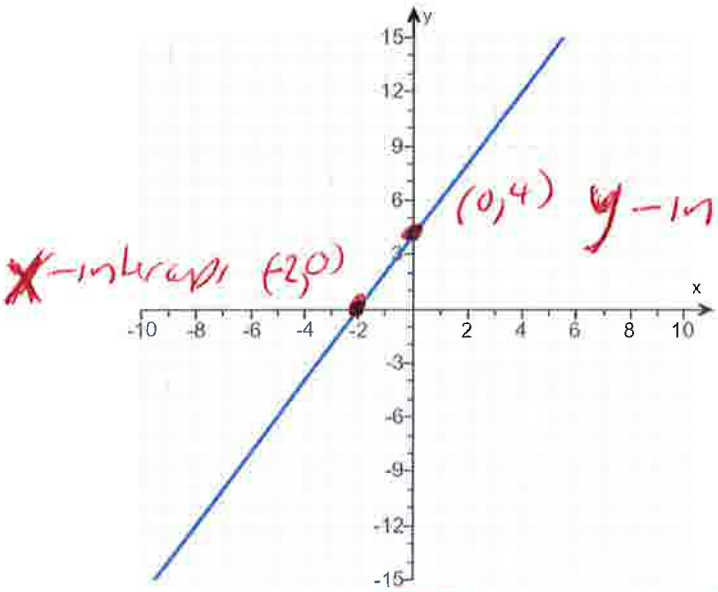
x	y
-2	0
0	4

x-intercept

y-intercept

Answers A. The intercept(s) is/are **(−2,0),(0,4)**.

(Type an ordered pair. Use a comma to separate answers as needed.)



Use graphing Calculator

$y_1 = 2x + 4$

Window

X-min = −12

X-max = 12

y-min = −10

y-max = 10

ID: F.2.19

Complete the square

48.

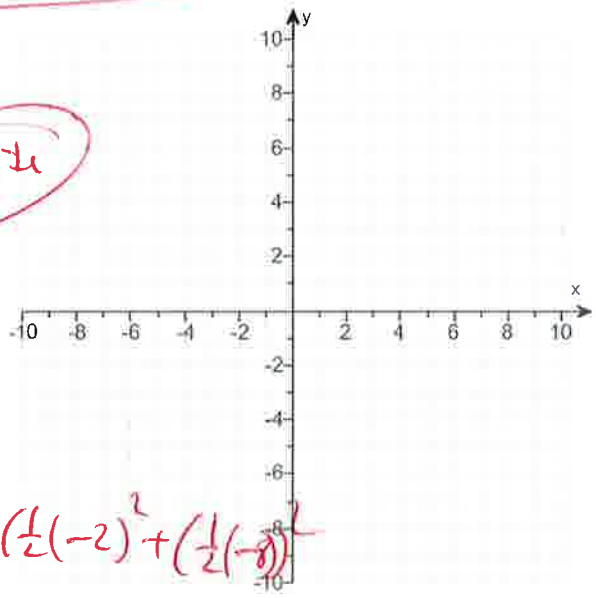
For the equation $x^2 + y^2 - 2x - 8y - 19 = 0$, do the following.

(a) Find the center (h,k) and radius r of the circle.
(b) Graph the circle.
(c) Find the intercepts, if any.

$x^2 - 2x + y^2 - 8y = +19$ rewrite

(a) The center is ____.
(Type an ordered pair.)

The radius is r = ____.



(b) Use the graphing tool to graph the circle.

(c) Find the intercepts, if any. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

$x^2 - 2x + \left(\frac{1}{2}(-2)\right)^2 + y^2 - 8y + \left(\frac{1}{2}(-8)\right)^2 = 19 + \left(\frac{1}{2}(-2)\right)^2 + \left(\frac{1}{2}(-8)\right)^2$

○ **A.** The intercept(s) is/are ____.
(Type an ordered pair. Use a comma to separate answers as needed. Type exact answers for each coordinate, using radicals as needed.)

○ **B.** There is no intercept.

$x^2 - 2x + (-1)^2 + y^2 - 8y + (-4)^2 = +19 + (-1)^2 + (-4)^2$

$x^2 - 2x + 1 + y^2 - 8y + 16 = +19 + 1 + 16$

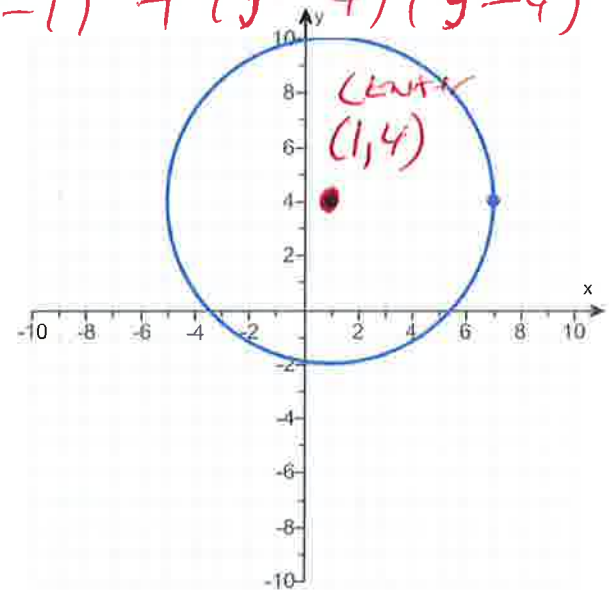
Answers (1,4)
6

$(x-1)(x-1) + (y-4)(y-4) = 36$

$(x-1)^2 + (y-4)^2 = 36$

CENTER (1, 4)

Radius $= \sqrt{36} = 6$



A. The intercept(s) is/are $(1-2\sqrt{5},0), (1+2\sqrt{5},0), (0,4-\sqrt{35}), (0,4+\sqrt{35})$.
(Type an ordered pair. Use a comma to separate answers as needed. Type exact answers for each coordinate, using radicals as needed.)

ID: F.4.27

49. Simplify the radical.

$\sqrt[5]{(4x-9)^5}$

The answer is [ ].

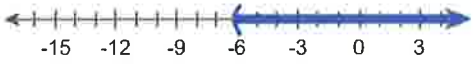
Answer: 4x − 9

ID: Quick Check P1.2.10

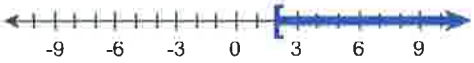
50. Solve the inequality $5 - 3x < -1$. Graph the solution set.

In set notation, the solution is $\{x|$ [ ] $\}$. (Type an inequality.)

Graph the solution set. Choose the correct graph below.

A. 

B. 

C. 

D. 

Answers x > 2

D. 

ID: 1.1.4

$5 - 3x < -1$

$5 - 3x - 5 < -1 - 5$

$-3x < -6$

$\frac{-3x}{-3} > \frac{-6}{-3}$

$x > 2$

$(2, \infty)$

51. Find the following for the function $f(x) = 3x^2 + 4x - 3$.

(a) f(0) **(b)** f(4) **(c)** f(−4) **(d)** f(−x)
(e) −f(x) **(f)** f(x + 3) **(g)** f(5x) **(h)** f(x + h)

(a) f(0) = _____ (Simplify your answer.)

(b) f(4) = _____ (Simplify your answer.)

(c) f(−4) = _____ (Simplify your answer.)

(d) f(−x) = _____ (Simplify your answer.)

(e) −f(x) = _____ (Simplify your answer.)

(f) f(x + 3) = _____ (Simplify your answer.)

(g) f(5x) = _____ (Simplify your answer.)

(h) f(x + h) = _____ (Simplify your answer.)

Answers −3
61
29
$3x^2 - 4x - 3$
$-3x^2 - 4x + 3$
$3x^2 + 22x + 36$
$75x^2 + 20x - 3$
$3x^2 + 6hx + 3h^2 + 4x + 4h - 3$

ID: 1.1.43

52. Find the domain of the function.

$f(x) = \sqrt{5x - 30}$

The domain is _____. (Type your answer in interval notation.)

Answer: [6,∞)

ID: 1.1.59

53. For the given functions f and g, complete parts (a)-(h). For parts (a)-(d), also find the domain.

$f(x) = 3x + 4$; $g(x) = 9x - 7$

(a) Find $(f + g)(x)$.

$(f + g)(x) =$ _____ (Simplify your answer.)

$f(x) + g(x) =$
$(3x+4) + (9x-7) =$
$3x+4+9x-7 =$
$12x-3 =$ ✓

dom: $(-\infty, \infty)$

What is the domain of f + g? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The domain is $\{x|$ _____ $\}$.
  (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain is {x| x is any real number}.

(b) Find $(f - g)(x)$.

$(f - g)(x) =$ _____ (Simplify your answer.)

$f(x) - g(x) =$
$(3x+4) - (9x-7) =$
$3x+4-9x+7 =$
$-6x+11 =$ ✓

dom: $(-\infty, \infty)$

What is the domain of f − g? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The domain is $\{x|$ _____ $\}$.
  (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain is {x| x is any real number}.

(c) Find $(f \cdot g)(x)$.

$(f \cdot g)(x) =$ _____ (Simplify your answer.)

$(f \cdot g)(x) =$
$f(x) \cdot g(x) =$
$(3x+4)(9x-7) =$
$27x^2 - 21x + 36x - 28 =$
$27x^2 + 15x - 28 =$ ✓

dom: $(-\infty, \infty)$

What is the domain of f • g? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The domain is $\{x|$ _____ $\}$.
  (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain is {x| x is any real number}.

(d) Find $\left(\frac{f}{g}\right)(x)$.

$\left(\frac{f}{g}\right)(x) =$ _____ (Simplify your answer.)

$\frac{f(x)}{g(x)} =$
$\frac{3x+4}{9x-7} =$ ✓

dom:
$9x-7 \neq 0$
$9x-7+7 = 0+7$
$9x = 7$
$\frac{9x}{9} \neq \frac{7}{9}$

What is the domain of $\frac{f}{g}$? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

$x \neq \frac{7}{9}$

- A. The domain is $\{x|$ _____ $\}$.
  (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain is {x| x is any real number}.

(e) Find $(f + g)(3)$.

$(f+g)(3) =$ _____ (Type an integer or a simplified fraction.)

(f) Find $(f-g)(2)$.

$(f-g)(2) =$ _____ (Type an integer or a simplified fraction.)

(g) Find $(f \cdot g)(4)$.

$(f \cdot g)(4) =$ _____ (Type an integer or a simplified fraction.)

(h) Find $\left(\frac{f}{g}\right)(1)$.

$\left(\frac{f}{g}\right)(1) =$ _____ (Type an integer or a simplified fraction.)

Answers $12x-3$

B. The domain is {x| x is any real number}.

$-6x+11$

B. The domain is {x| x is any real number}.

$27x^2+15x-28$

B. The domain is {x| x is any real number}.

$\frac{3x+4}{9x-7}$

A. The domain is $\left\{x \middle| x \neq \frac{7}{9}\right\}$.

(Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

33

-1

464

$\frac{7}{2}$

ID: 1.1.67

$(f+g)(x) = 12x-3$

$(f+g)(3) = 12(3)-3$

$(f+g)(3) = 36-3$

$(f+g)(3) = 33$

$(f-g)(x) = -6x+11$

$(f-g)(2) = -6(2)+11$

$(f-g)(2) = -12+11$

$(f-g)(2) = -1$

$(f \cdot g)(x) = 27x^2+15x-28$

$(f \cdot g)(4) = 27(4)^2+15(4)-28$

$(f \cdot g)(4) = 27(4)(4)+15(4)-28$

$(f \cdot g)(4) = 432+60-28$

$(f \cdot g)(4) = 464$

$\left(\frac{f}{g}\right)(x) = \frac{3x+4}{9x-7}$

$\left(\frac{f}{g}\right)(1) = \frac{3(1)+4}{9(1)-7}$

$\left(\frac{f}{g}\right)(1) = \frac{3+4}{9-7}$

$\left(\frac{f}{g}\right)(1) = \frac{7}{2}$

54. For the given functions f and g, complete parts (a)-(h). For parts (a)-(d), also find the domain.

$f(x) = x - 6$; $g(x) = 8x^2$

(a) Find $(f + g)(x)$.

$(f + g)(x) =$ _____ (Simplify your answer.)

$(f+g)(x) = f(x) + g(x) = (x-6) + (8x^2) = x - 6 + 8x^2 = 8x^2 + x - 6$

What is the domain of f + g? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The domain is $\{x|$ _____ $\}$.
  (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain is {x| x is any real number}.

(b) Find $(f - g)(x)$.

$(f - g)(x) =$ _____ (Simplify your answer.)

$(f-g)(x) = f(x) - g(x) = (x-6) - (8x^2) = x - 6 - 8x^2 = -8x^2 + x - 6$

What is the domain of f − g? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The domain is $\{x|$ _____ $\}$.
  (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain is {x| x is any real number}.

(c) Find $(f \cdot g)(x)$.

$(f \cdot g)(x) =$ _____ (Simplify your answer.)

$(f \cdot g)(x) = f(x) \cdot g(x) = (x-6)(8x^2) = 8x^3 - 48x^2$

What is the domain of f • g? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The domain is $\{x|$ _____ $\}$.
  (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain is {x| x is any real number}.

(d) Find $\left(\frac{f}{g}\right)(x)$.

$\left(\frac{f}{g}\right)(x) =$ _____ (Simplify your answer.)

$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)} = \frac{x-6}{x^2}$

What is the domain of $\frac{f}{g}$? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The domain is $\{x|$ _____ $\}$.
  (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain is {x| x is any real number}.

(e) Find $(f + g)(4)$.

$(f+g)(x) = 8x^2 + x - 6$

$(f+g)(4) = 8(4)^2 + (4) - 6$

$(f+g)(4) = 8(4)(4) + (4) - 6$

$(f+g)(4) = 128 + 4 - 6$

$(f+g)(4) = 126$

$(f+g)(4) =$ _____ (Type an integer or a simplified fraction.)

(f) Find $(f-g)(3)$.

$(f-g)(3) =$ _____ (Type an integer or a simplified fraction.)

(g) Find $(f \cdot g)(2)$.

$(f \cdot g)(2) =$ _____ (Type an integer or a simplified fraction.)

(h) Find $\left(\frac{f}{g}\right)(4)$.

$\left(\frac{f}{g}\right)(4) =$ _____ (Type an integer or a simplified fraction.)

Answers $8x^2 + x - 6$

B. The domain is {x| x is any real number}.

$-8x^2 + x - 6$

B. The domain is {x| x is any real number}.

$8x^3 - 48x^2$

B. The domain is {x| x is any real number}.

$\frac{x-6}{8x^2}$

A. The domain is {x| x ≠ 0}.

(Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

126

-75

-128

$-\frac{1}{64}$

ID: 1.1.69

55. Find the difference quotient of f; that is, find $\frac{f(x+h)-f(x)}{h}$, $h \neq 0$, for the following function. Be sure to simplify.

$f(x) = x^2 - 4x + 7$

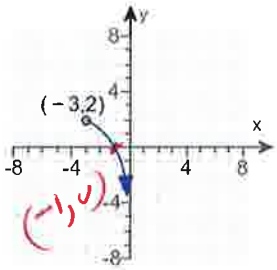
$\frac{f(x+h)-f(x)}{h} =$ _____

Answer: $2x + h - 4$

ID: 1.1.83

56. Determine whether the graph on the right is that of a function by using the vertical-line test. If it is, use the graph to find the following.

(a) the domain and range
(b) the intercepts, if any
(c) any symmetry with respect to the x-axis, y-axis, or the origin



Does the graph represent a function? Choose the correct answer below.

- A. Yes, the graph is a function because every vertical line intersects the graph in at most one point.
- B. No, the graph is not a function because a vertical line $x = -2$ intersects the graph at two points.
- C. Yes, the graph is a function because every vertical line intersects the graph in more than one point.
- D. No, the graph is not a function because a vertical line $x = -2$ intersects the graph at only one point.

(a) What are the domain and range of the function? Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice. [left, right] [bottom, Top]

- A. The domain is $(-3, 0)$. The range is $(-\infty, 2)$
  (Type your answers in interval notation. Use integers or fractions for any numbers in the expressions.)
- B. The graph is not that of a function.

(b) What is/are the intercept(s)? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The intercept(s) is/are $(-1, 0)$.
  (Type an ordered pair. Use a comma to separate answers as needed.)
- B. There are no intercepts.
- C. The graph is not that of a function.

(c) Determine if the graph is symmetric with respect to the x-axis, y-axis, or the origin. Select all that apply.

- [ ] A. The graph is symmetric with respect to the y-axis.
- [ ] B. The graph is symmetric with respect to the x-axis.
- [ ] C. The graph is symmetric with respect to the origin.
- [x] D. The graph has no symmetry.
- [ ] E. The graph is not that of a function.

Answers A. Yes, the graph is a function because every vertical line intersects the graph in at most one point.

A. The domain is $(-3,0)$. The range is $(-\infty,2)$.
(Type your answers in interval notation. Use integers or fractions for any numbers in the expressions.)

A. The intercept(s) is/are $(-1,0)$.(Type an ordered pair. Use a comma to separate answers as needed.)

D. The graph has no symmetry.

ID: 1.2.19

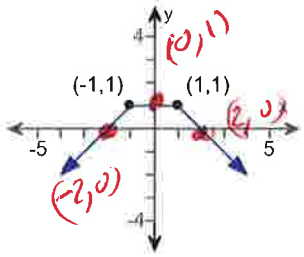
57.

Determine whether the graph is that of a function by using the vertical-line test. If it is, use the graph to find

(a) its domain and range.

(b) the intercepts, if any.

(c) any symmetry with respect to the x-axis, y-axis, or the origin.



Is the graph that of a function?

- [x] Yes
- [ ] No

If the graph is that of a function, what are the domain and range of the function? Select the correct choice below and fill in any answer boxes within your choice. [left, right] [bottom, Top]

- [x] **A.** The domain is $(-\infty, \infty)$. The range is $(-\infty, 1]$.
  (Type your answers in interval notation.)
- [ ] **B.** The graph is not a function.

What are the intercepts? Select the correct choice below and fill in any answer boxes within your choice.

- [x] **A.** $(2,0)$ $(-2,0)$ $(0,1)$
  (Type an ordered pair. Use a comma to separate answers as needed.)
- [ ] **B.** There are no intercepts.
- [ ] **C.** The graph is not a function.

Determine if the graph is symmetrical.

- [x] **A.** It is symmetrical with respect to the y-axis.
- [ ] **B.** It is symmetrical with respect to the origin.
- [ ] **C.** It is symmetrical with respect to the x-axis.
- [ ] **D.** The graph is not symmetrical.
- [ ] **E.** The graph is not a function.

Answers Yes

A. The domain is $(-\infty,\infty)$. The range is $(-\infty,1]$. (Type your answers in interval notation.)

A. $(2,0),(-2,0),(0,1)$ (Type an ordered pair. Use a comma to separate answers as needed.)

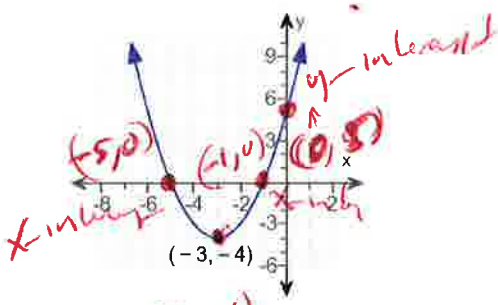
A. It is symmetrical with respect to the y-axis.

ID: 1.2.21

58.

Determine whether the graph is that of a function by using the vertical-line test. If it is, use the graph to find:

(a) The domain and range
(b) The intercepts, if any
(c) Any symmetry with respect to the x-axis, the y-axis, or the origin



Is the graph that of a function?

- (•) Yes
- ( ) No

(a) If the graph is that of a function, what are its domain and range? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- (•) **A.** The domain is $(-\infty, \infty)$. The range is $[-4, \infty)$.
  (Type your answers in interval notation.)
- ( ) **B.** The graph is not a function.

(b) If the graph is that of a function, what are its intercepts? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- (•) **A.** The intercepts are $(-1, 0)$ $(-5, 0)$ $(0, 5)$
  (Type an ordered pair. Use a comma to separate answers as needed.)
- ( ) **B.** There are no intercepts.
- ( ) **C.** The graph is not a function.

(c) If the graph is that of a function, determine what kinds of symmetry it has. Select all that apply.

- [ ] **A.** It is symmetric with respect to the x-axis.
- [ ] **B.** It is symmetric with respect to the y-axis.
- [ ] **C.** It is symmetric with respect to the origin.
- [x] **D.** The graph is not symmetric with respect to the x-axis, y-axis, or the origin.
- [ ] **E.** The graph is not a function.

Answers Yes

A. The domain is $(-\infty,\infty)$. The range is $[-4,\infty)$. (Type your answers in interval notation.)

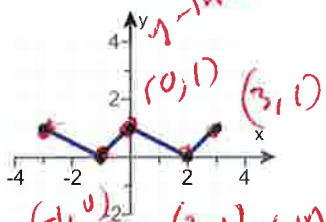
A. The intercepts are $(-1,0),(-5,0),(0,5)$
(Type an ordered pair. Use a comma to separate answers as needed.)

D. The graph is not symmetric with respect to the x-axis, y-axis, or the origin.

ID: 1.2.23

59. Using the given graph of the function f, find the following.

(a) the intercepts, if any
(b) its domain and range
(c) the intervals on which it is increasing, decreasing, or constant
(d) whether it is even, odd, or neither



y-intercept (0,1)
(-3,0) (3,0)
(-1,0) (2,0)
x-intercepts

(a) What are the intercepts?

(-1,0) (2,0) (0,1)

(Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)

(b) The domain is [-3, 3]. ← [left, right]

(Type your answer in interval notation.)

The range is [0, 1] ← [bottom, top]

(Type your answer in interval notation.)

(c) On which interval(s) is the graph increasing? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is increasing on [-1, 0], [2, 3].
  (Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not increasing on any interval.

On which interval(s) is the graph decreasing? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is decreasing on [-3, -1], [0, 2].
  (Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not decreasing on any interval.

On which interval(s) is the graph constant? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is constant on _____.
  (Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not constant on any interval.

(d) The function is (1) _____

(1)
- odd.
- even.
- neither odd nor even.

Answers $(-1,0),(2,0),(0,1)$

$[-3,3]$

$[0,1]$

A. The graph is increasing on $[-1,0],[2,3]$.
(Type your answer in interval notation. Use a comma to separate answers as needed.)

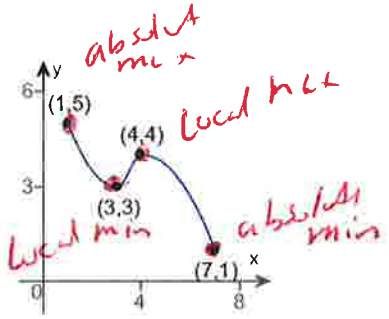
A. The graph is decreasing on $[-3,-1],[0,2]$.
(Type your answer in interval notation. Use a comma to separate answers as needed.)

B. The graph is not constant on any interval.

(1) neither odd nor even.

ID: 1.3.25

60. For the graph of a function y = f(x) shown to the right, find the absolute maximum and the absolute minimum, if they exist. Identify any local maxima or local minima.



Select the correct answer below and, if necessary, fill in the answer boxes to complete your choice.

- A. The absolute maximum of y = f(x) is f(1) = 5 . OR (1, 5)
  (Type integers or simplified fractions.)
- B. There is no absolute maximum for y = f(x).

Select the correct answer below and, if necessary, fill in the answer boxes to complete your choice.

- A. The absolute minimum of y = f(x) is f(7) = 1 . OR (7, 1)
  (Type integers or simplified fractions.)
- B. There is no absolute minimum for y = f(x).

Select the correct answer below and, if necessary, fill in the answer boxes to complete your choice.

- A. The local maximum of y = f(x) is f(4) = 4 . OR (4, 4)
  (Type integers or simplified fractions.)
- B. The local maxima of y = f(x) are f( ) = and f( ) = .
  (Use ascending order with respect to x. Type integers or simplified fractions.)
- C. There is no local maximum for y = f(x).

Select the correct answer below and, if necessary, fill in the answer boxes to complete your choice.

- A. The local minimum of y = f(x) is f(3) = 3 . OR (3, 3)
  (Type integers or simplified fractions.)
- B. The local minima of y = f(x) are f( ) = and f( ) = .
  (Use ascending order with respect to x. Type integers or simplified fractions.)
- C. There is no local minimum for y = f(x).

Answers A. The absolute maximum of y = f(x) is f(1) = 5 .(Type integers or simplified fractions.)

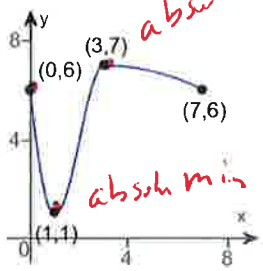
A. The absolute minimum of y = f(x) is f(7) = 1 .(Type integers or simplified fractions.)

A. The local maximum of y = f(x) is f(4) = 4 .(Type integers or simplified fractions.)

A. The local minimum of y = f(x) is f(3) = 3 .(Type integers or simplified fractions.)

ID: 1.3.49

61. For the graph of a function y = f(x) shown to the right, find the absolute maximum and the absolute minimum, if they exist. Identify any local maxima or local minima.



Select the correct answer below and, if necessary, fill in the answer boxes to complete your choice.

- A. The absolute maximum of y = f(x) is f(3) = 7 . OR (3, 7)
  (Type integers or simplified fractions.)
- B. There is no absolute maximum for y = f(x).

Select the correct answer below and, if necessary, fill in the answer boxes to complete your choice.

- A. The absolute minimum of y = f(x) is f(1) = 1 . OR (1, 1)
  (Type integers or simplified fractions.)
- B. There is no absolute minimum for y = f(x).

Select the correct answer below and, if necessary, fill in the answer boxes to complete your choice.

- A. The local maximum of y = f(x) is f(3) = 7 . OR (3, 7)
  (Type integers or simplified fractions.)
- B. The local maxima of y = f(x) are f( ) = and f( ) = .
  (Use ascending order with respect to x. Type integers or simplified fractions.)
- C. There is no local maximum for y = f(x).

Select the correct answer below and, if necessary, fill in the answer boxes to complete your choice.

- A. The local minimum of y = f(x) is f(1) = 1 . OR (1, 1)
  (Type integers or simplified fractions.)
- B. The local minima of y = f(x) are f( ) = and f( ) = .
  (Use ascending order with respect to x. Type integers or simplified fractions.)
- C. There is no local minimum for y = f(x).

Answers A. The absolute maximum of y = f(x) is f(3) = 7 .(Type integers or simplified fractions.)

A. The absolute minimum of y = f(x) is f(1) = 1 .(Type integers or simplified fractions.)

A. The local maximum of y = f(x) is f(3) = 7 .(Type integers or simplified fractions.)

A. The local minimum of y = f(x) is f(1) = 1 .(Type integers or simplified fractions.)

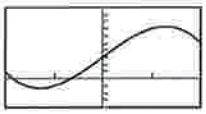
ID: 1.3.51

62. (a) Use a graphing utility to graph $f(x) = x^3 - 5x + 3$ on the interval $[-2,2]$ and approximate any local maxima and local minima.

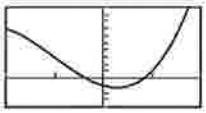
(b) Determine where f is increasing and where it is decreasing.

(a) Using a graphing utility, graph the function for $-2 \le x \le 2$ and $-4 \le y \le 10$. Choose the correct graph, below.

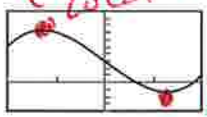
○ **A.**



○ **B.**



○ **C.**



The local maximum is y ≈ 7.30 and it occurs at x ≈ −1.29. (Round to two decimal places.)

The local minimum is y ≈ −1.30 and it occurs at x ≈ 1.29. (Round to two decimal places.)

(b) Where is the graph of f increasing?

- ◉ [−2, −1.29] and [1.29,2]
- ○ [−1.30,7.30]
- ○ [−2, −1.29] and [−1.30,7.30]
- ○ [−1.29,1.29]

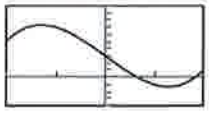
(Choose the answer that most completely answers the question.)

Where is the graph of f decreasing?

- ○ [−2, −1.29] and [1.29,2]
- ○ [−1.30,7.30]
- ◉ [−1.29,1.29]
- ○ [−2, −1.30] and [2,7.30]

(Choose the answer that most completely answers the question.)

Answers

C. 

7.30

−1.29

−1.30

1.29

[−2, −1.29] and [1.29,2]

[−1.29,1.29]

ID: 1.3.57-GC

63. The function f is defined as follows.

$$f(x) = \begin{cases} -2x+3 & \text{if } x < 1 \\ 2x-1 & \text{if } x \geq 1 \end{cases}$$

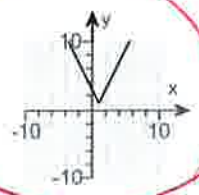
(a) Find the domain of the function.
(b) Locate any intercepts.
(c) Graph the function.
(d) Based on the graph, find the range.

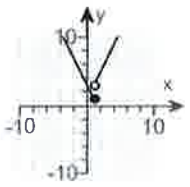
(a) The domain of the function f is $(-\infty, \infty)$ ← [Left, right]
(Type your answer in interval notation.)

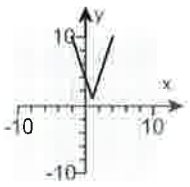
(b) Locate any intercepts. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

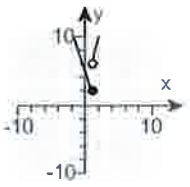
- A. The intercept(s) is/are $(0,3)$.
  (Type an ordered pair. Use a comma to separate answers as needed.)
- B. There are no intercepts.

(c) Choose the correct graph below.

A. 

B. 

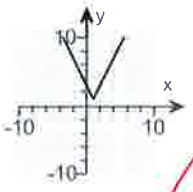
C. 

D. 

(d) The range of the function f is $[1,\infty)$ ← [bottom, top]
(Type your answer in interval notation.)

Answers $(-\infty,\infty)$

A. The intercept(s) is/are **(0,3)**.
(Type an ordered pair. Use a comma to separate answers as needed.)



A.

[1,∞)

Use graphing calculator
Windows
X-min = -12
X-max = 12
y-min = -10
y-max = 10

$y_1 = -2x+3$ $(x<1)$ open circle
$y_2 = 2x-1$ $(x \geq 1)$ close circle

ID: 1.4.33

64. The function f is defined as follows.

$$f(x) = \begin{cases} 4+x & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$$

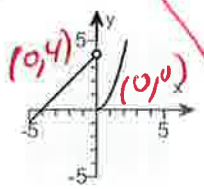
(a) Find the domain of the function.
(b) Locate any intercepts.
(c) Graph the function.
(d) Based on the graph, find the range.

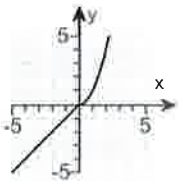
(a) The domain of the function f is $(-\infty, \infty)$ ← (left, right)
(Type your answer in interval notation.)

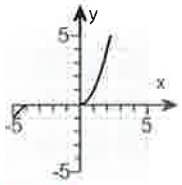
(b) Locate any intercepts. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

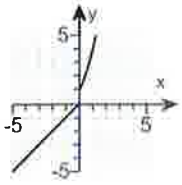
- A. The intercept(s) is/are $(-4,0)$ $(0,0)$
  (Type an ordered pair. Use a comma to separate answers as needed.)
- B. There are no intercepts.

(c) Choose the correct graph of f(x) below.

A. 

B. 

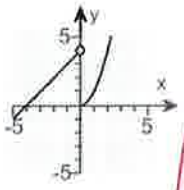
C. 

D. 

(d) The range of the function f is $(-\infty, \infty)$ ← [bottom, top]
(Type your answer in interval notation.)

Answers $(-\infty, \infty)$

A. The intercept(s) is/are $(-4,0),(0,0)$.
(Type an ordered pair. Use a comma to separate answers as needed.)

A. 

$(-\infty, \infty)$

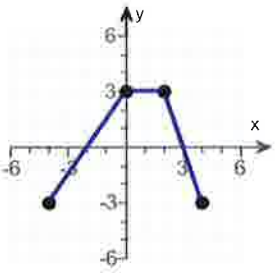
Window
X-min = -12
X-max = 12
y-min = -10
y-max = 10

use graphing Calculator

ID: 1.4.37

$y_1 = 4 + x \div (x < 0)$ open circle
$y_2 = x^2 \div (x \geq 0)$ close circle

65. The graph of a function f is illustrated to the right. Use the graph of f as the first step toward graphing each of the following functions.



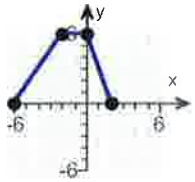
(a) $F(x) = f(x) + 3$ (b) $G(x) = f(x + 2)$ (c) $P(x) = -f(x)$

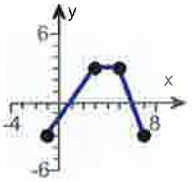
(d) $H(x) = f(x + 2) - 2$ (e) $Q(x) = \frac{1}{3}f(x)$ (f) $g(x) = f(-x)$

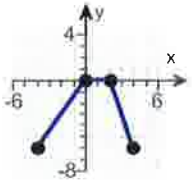
(g) $h(x) = f(2x)$

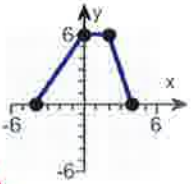
(a) Choose the correct graph of $F(x) = f(x) + 3$ below.

A. B. C. D.



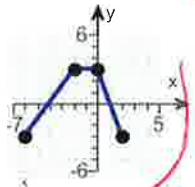


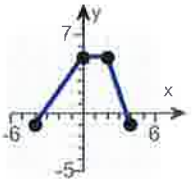


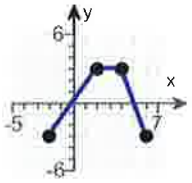


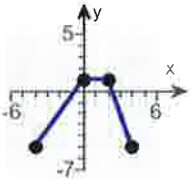
(b) Choose the correct graph of $G(x) = f(x + 2)$ below.

A. B. C. D.



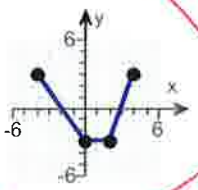


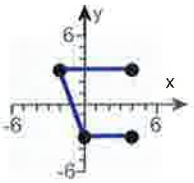


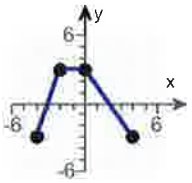


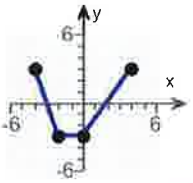
(c) Choose the correct graph of $P(x) = -f(x)$ below.

A. B. C. D.





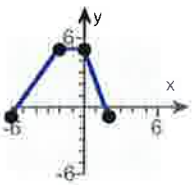


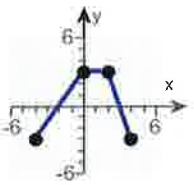


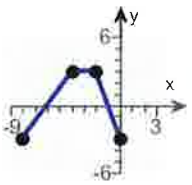
(d) Choose the correct graph of $H(x) = f(x + 2) - 2$ below.

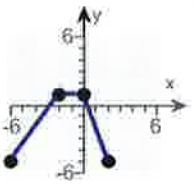
shift left −2 shift down −2

A. B. C. D.

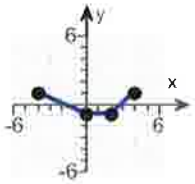


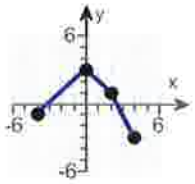
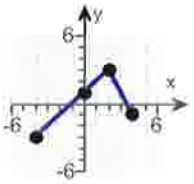






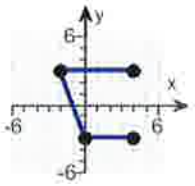
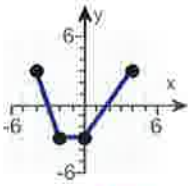
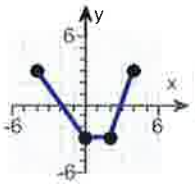
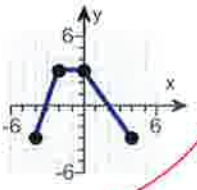
(e) Choose the correct graph of $Q(x) = \frac{1}{3}f(x)$ below.



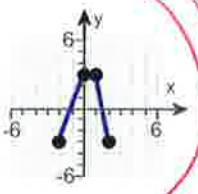
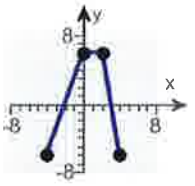
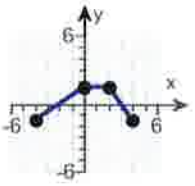
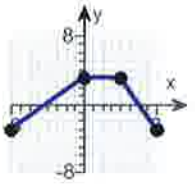
(f) Choose the correct graph of $g(x) = f(-x)$ below.

A. B. C. D.

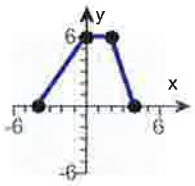





(g) Choose the correct graph of $h(x) = f(2x)$ below.

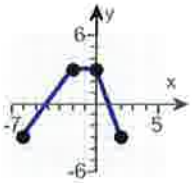
A. B. C. D.

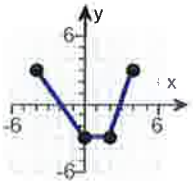
Answers



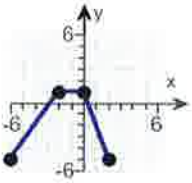
D.



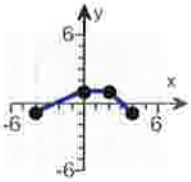
A.



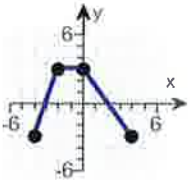
A.



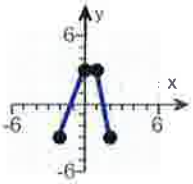
D.



B.



D.

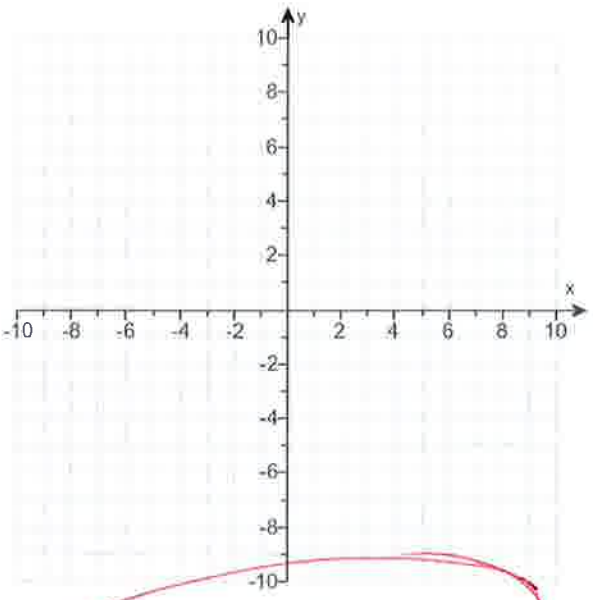


A.

ID: 1.5.63

66.

(a) Graph $f(x) = |x + 5| - 3$ using transformations.
(b) Find the area of the region bounded by f and the x-axis that lies below the x-axis.



(a) Graph f(x).

(Use the graphing tool provided to graph the function.)

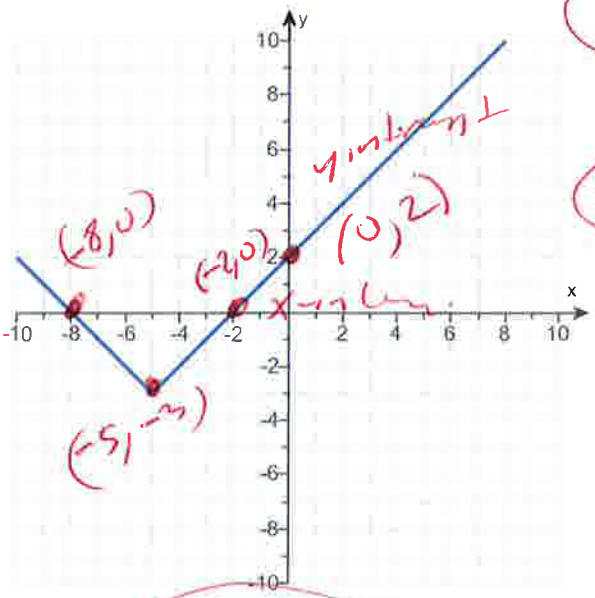
(b) The area of the region bounded by f and the x-axis that lies below the x-axis is _____ square units.
(Simplify your answer.)

$f(x) = |x+5| - 3$

Shift left −5

Shift down −3

Answers



y-intercept (0, 2)

x-intercepts (−8, 0), (−2, 0)

(−5, −3)

Use graphing calculator

x	f(x)
−8	0
−5	−3
−2	0
0	2

Windows
X-Min = −12
X-Max = 12
Y-Min = −10
Y-Max = 10

$Y_1 = \text{MathNum, abs}$

$Y_1 = \text{abs}(X+5) - 3$

9

ID: 1.5.81

67. Find the slope of the line joining the points (5,1) and (8, − 3).

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The slope is _____. (Simplify your answer.)
- ○ **B.** The slope is undefined.

Answer: A. The slope is $-\frac{4}{3}$. (Simplify your answer.)

ID: 2.1.2

68. Solve the following equation.

$60x - 1200 = -25x + 3050$

The solution set is { }. (Simplify your answer.)

Answer: 50

ID: 2.1.4

$60x - 1200 = -25x + 3050$

$60x - 1200 + 1200 = -25x + 3050 + 1200$

$60x = -25x + 4250$

$60x + 25x = -25x + 4250 + 25x$

$85x = 4250$

$\frac{85x}{85} = \frac{4250}{85}$

$x = 50$

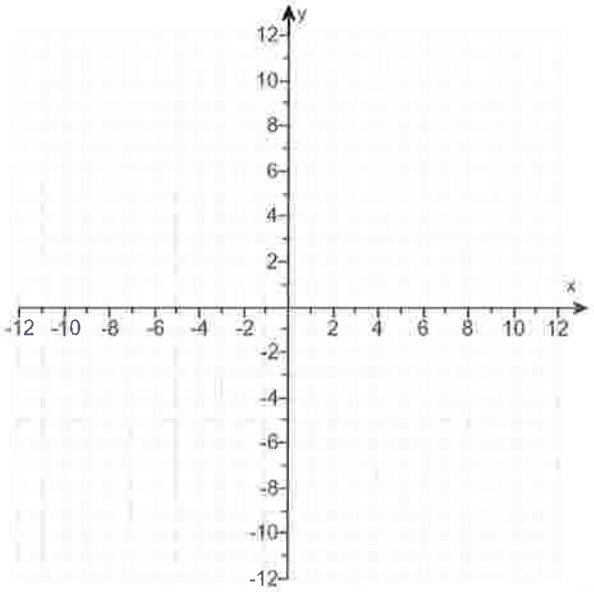
69.

(a) Find the zero of the linear function and (b) graph the function using the zero and y-intercept.

$g(x) = 2x - 8$

(a) The zero is _____.
(Type a whole number.)

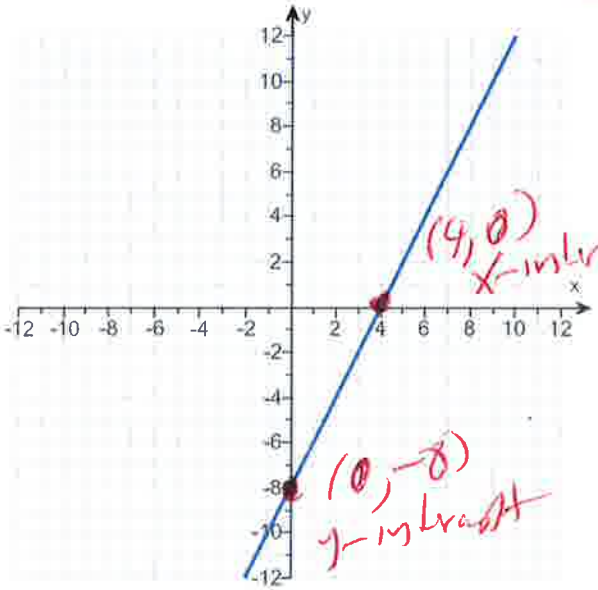
(b) Use the graphing tool to graph the linear equation. Use the intercepts when drawing the line.



$g(x) = 2x - 8$

x	g(x)
0	-8
4	0

Answers 4



y = 1

graphing calculator

$y_1 = 2x - 8$

ID: 2.1.21

Window
x-min = -12
x-max = 12
y-min = -10
y-max = 10

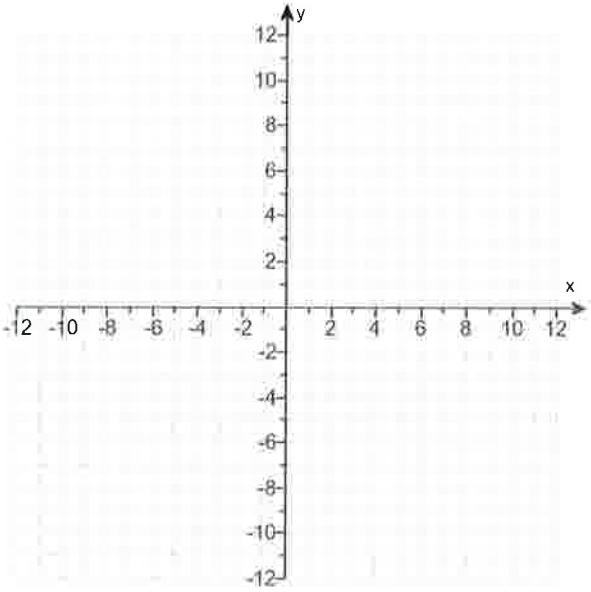
70.

(a) Find the zero of the linear function and
(b) graph the function using the zero and y-intercept.

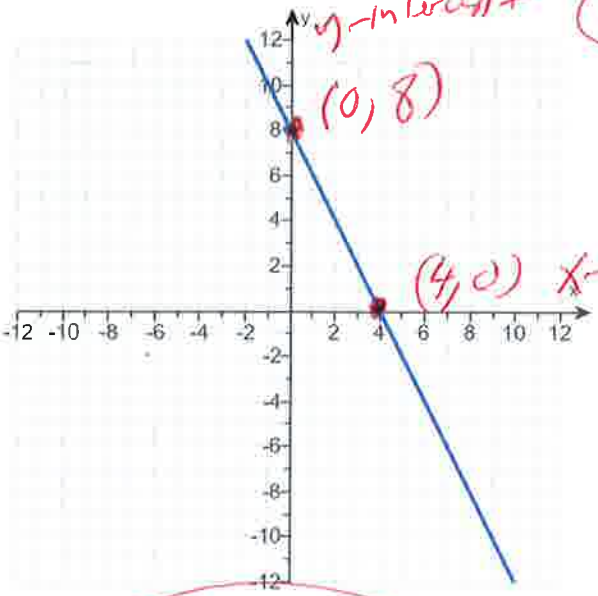
$g(x) = -2x + 8$

(a) The zero is [ ].
(Type a whole number.)

(b) Use the graphing tool to graph the linear equation. Use the intercepts when drawing the line.



Answers 4



y-intercept
(0, 8)
(4, 0) x-intercept

$g(x) = -2x + 8$

x	g(x)
0	8
4	0

Use graphing calculator

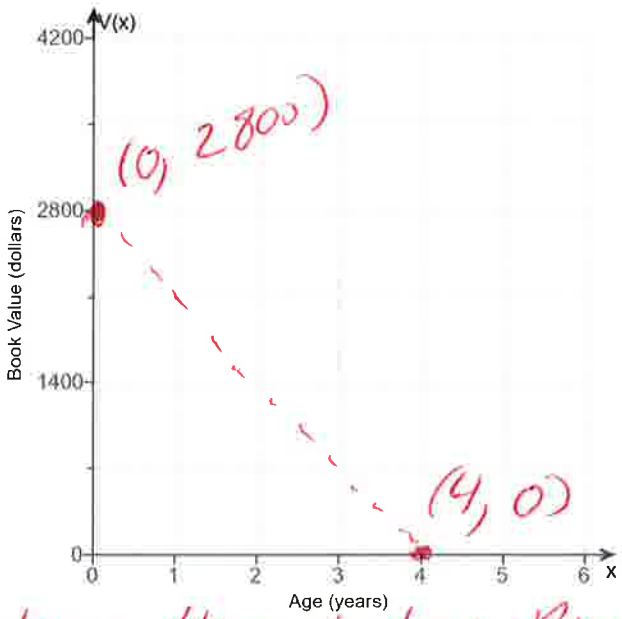
$Y_1 = -2X + 8$

Window
$x\text{-min} = -12$
$x\text{-max} = 12$
$y\text{-min} = -10$
$y\text{-max} = 10$

ID: 2.1.23

71.

Suppose that a company has just purchased a new computer for $2800. The company chooses to depreciate using the straight-line method for 4 years.



(a) Write a linear function that expresses the book value of the computer as a function of its age.

V(x) = ☐

(Type your answer in slope-intercept form.)

(b) What is the implied domain of the function found in part **(a)**?

☐

(Type your answer in interval notation.)

(c) Use the graphing tool to graph the linear equation.

(d) What is the book value of the computer after 2 years?

$ ☐

(Round to the nearest dollar as needed.)

(e) When will the computer be worth $2100?

After ☐ year(s) the computer will be worth $2100.

(Type a whole number.)

Equation of line through two Points Formula

$(0, 2800)$ $(4, 0)$

x_1 y_1 x_2 y_2

$y - y_1 = \frac{y_1 - y_2}{x_1 - x_2}(x - x_1)$

$y - (2800) = \frac{(2800) - (0)}{(0) - (4)}(x - (0))$

$y - 2800 = \frac{2800 - 0}{0 - 4}(x - 0)$

$y - 2800 = \frac{2800}{-4}(x)$

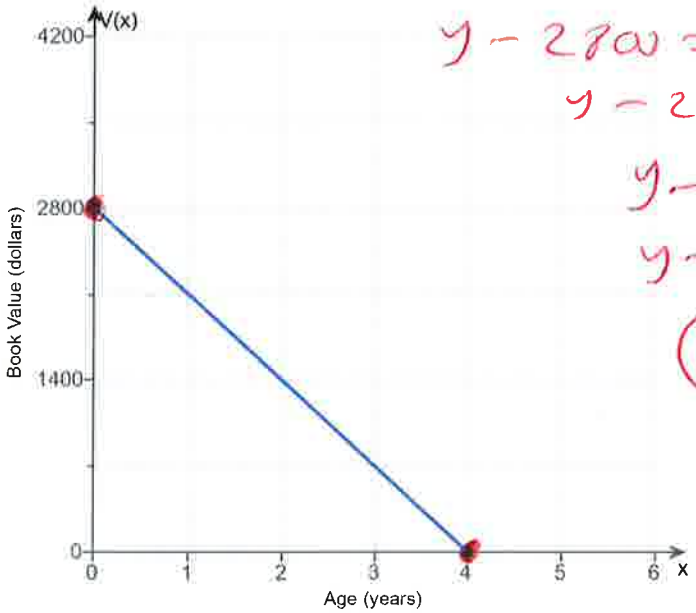
$y - 2800 = -700x$

$y - 2800 + 2800 = -700x + 2800$

$y = -700x + 2800$

Answers $-700x + 2800$

[0,4]



1400

1

ID: 2.1.51

72. Factor the given polynomial completely. If the polynomial cannot be factored, say that it is prime.

$x^2 + 8x + 15$ = $(x+3)(x+5)$ Check

Select the correct choice below and fill in any answer boxes within your choice.

- A. $x^2 + 8x + 15 =$ _____
- B. The polynomial is prime.

$(x+3)(x+5) =$
$x^2 + 5x + 3x + 15 =$
$x^2 + 8x + 15 =$
Good

Answer: A. $x^2 + 8x + 15 =$ **(x + 5)(x + 3)**

ID: 2.3.1

73. Solve the equation.

$(x - 6)(5x + 6) = 0$

$(x-6)(5x+6) = 0$
$x - 6 = 0$ OR $5x + 6 = 0$
$5x + 6 - 6 = 0 - 6$
$5x = -6$
$\frac{5x}{5} = \frac{-6}{5}$
$x = -6/5$
$x - 6 + 6 = 0 + 6$ OR
$x = 6$

The solution set is {_____}. (Use a comma to separate answers as needed.)

Answer: $6, -\frac{6}{5}$

ID: 2.3.3

74. Find the zeros of the quadratic function by factoring. What are the x-intercepts of the graph of the function?

$F(x) = x^2 - x - 30$

Select the correct choice below and fill in the answer box to complete your choice.
(Use a comma to separate answers as needed. Type an integer or a simplified fraction.)

- A. The zeros and the x-intercepts are the same. They are _____.
- B. The zeros and the x-intercepts are different. The zeros are _____, the x-intercepts are _____.

$F(x) = x^2 - x - 30$

Answer: A. The zeros and the x-intercepts are the same. They are **−5,6**.

$x^2 - x - 30 = 0$
$(x+5)(x-6) = 0$
$x + 5 = 0$ OR $x - 6 = 0$
$x + 5 - 5 = 0 - 5$ OR $x - 6 + 6 = 0 + 6$
$x = -5$ OR $x = 6$

ID: 2.3.17

75. Find the zeros of the quadratic function by factoring. What are the x-intercepts of the graph of the function?

$g(x) = 2x^2 - 3x - 2$

Select the correct choice below and fill in the answer box to complete your choice.
(Use a comma to separate answers as needed. Type an integer or a simplified fraction.)

- A. The zeros and the x-intercepts are the same. They are _____
- B. The zeros and the x-intercepts are different. The zeros are _____, the x-intercepts are _____.

Answer: A. The zeros and the x-intercepts are the same. They are $-\frac{1}{2}, 2$.

ID: 2.3.19

76. Find the zeros of the quadratic function using the square root method. What are the x-intercepts of the graph of the function?

$g(x) = (x-1)^2 - 9$

Select the correct choice below and fill in the answer box to complete your choice.
(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

- A. The zeros and the x-intercepts are the same. They are _____.
- B. The zeros and the x-intercepts are different. The zeros are _____, the x-intercepts are _____.

Answer: A. The zeros and the x-intercepts are the same. They are 4, −2.

ID: 2.3.29

77. Find the real zeros, if any, of the quadratic function using the quadratic formula. What are the x-intercepts, if any, of the graph of the function?

$f(x) = x^2 + 6x + 6$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.
(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

- A. The zeros and the x-intercepts are different. The zeros are _____, the x-intercepts are _____.
- B. The zeros and the x-intercepts are the same. They are _____.
- C. There is no real zero solution and no x-intercept.

Answer: B. The zeros and the x-intercepts are the same. They are $-3+\sqrt{3}, -3-\sqrt{3}$.

ID: 2.3.39

78. Find the zeros, if any, of the quadratic function using the quadratic formula. What are the x-intercepts, if any, of the graph of the function?

$f(x) = 4x^2 + 1 + 6x$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.
(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

- A. The zeros and the x-intercepts are different. The zeros are _____, the x-intercepts are _____.
- B. The zeros and the x-intercepts are the same. They are _____.
- C. There is no real zero solution and no x-intercept.

Answer: B. The zeros and the x-intercepts are the same. They are $\frac{-3+\sqrt{5}}{4}, \frac{-3-\sqrt{5}}{4}$.

ID: 2.3.47

79. Find the real zeros, if any, of the following quadratic function using the quadratic formula. What are the x-intercepts, if any, of the graph of the function?

$G(x) = 3x(x+2) - 2$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.
(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

- A. The zeros and the x-intercepts are the same. They are _____.
- B. The zeros and the x-intercepts are different. The zeros are _____, the x-intercepts are _____.
- C. There is no real zero solution and no x-intercept.

Answer: A. The zeros and the x-intercepts are the same. They are $\frac{-3+\sqrt{15}}{3}, \frac{-3-\sqrt{15}}{3}$.

ID: 2.3.49

80. Find the real zeros of the quadratic function using any method you wish. What are the x-intercepts, if any, of the graph of the function?

$G(x) = 8x^2 + 10x - 25$

Select the correct choice below and fill in the answer box to complete your choice.

- A. The zeros and the x-intercepts are the same. They are _____
- B. The zeros and the x-intercepts are different. The zeros are _____, the x-intercepts are _____.

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

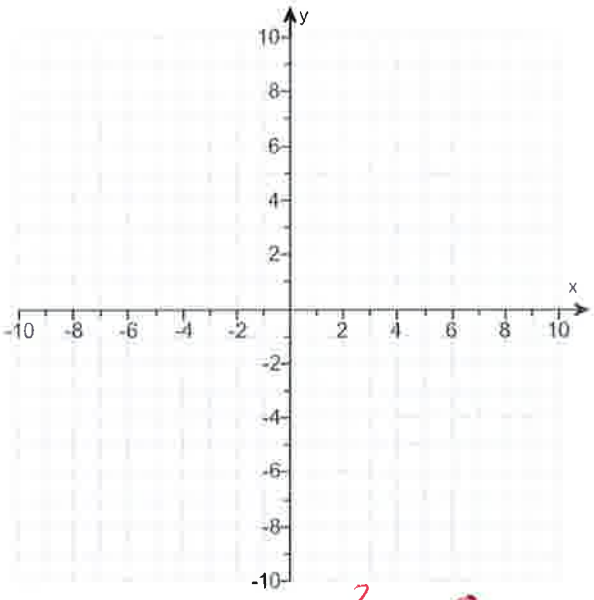
Answer: A. The zeros and the x-intercepts are the same. They are $-\frac{5}{2}, \frac{5}{4}$

ID: 2.3.81

81.

a. Graph the following function using transformations.
b. Find the real zeros of the function.
c. Determine the x-intercepts on the graph of the function.

$g(x) = (x + 3)^2 - 9$



a. Graph the function using transformations.

b. What are the zeros of the function?

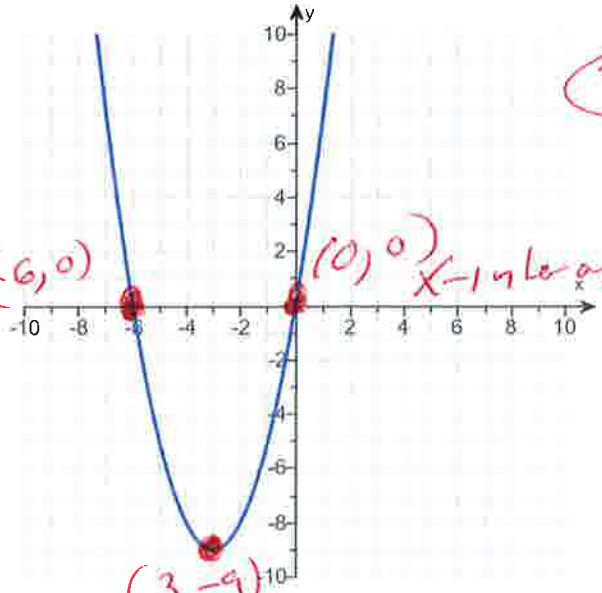
(Simplify your answer. Use a comma to separate answers as needed.)

c. What are the x-intercepts?

(Simplify your answer. Use a comma to separate answers as needed.)

$g(x) = (x+3)^2 - 9$
shift left −3 (opposite)
shift down −9

Answers



x-intercept (−6, 0)
(0, 0) x-intercept
(−3, −9) vertex

x	g(x)
−6	0
−3	−9
0	0

vertex

use graphing calculator

$y_1 = (x+3)^2 - 9$ (BIG)

0, −6

0, −6

min

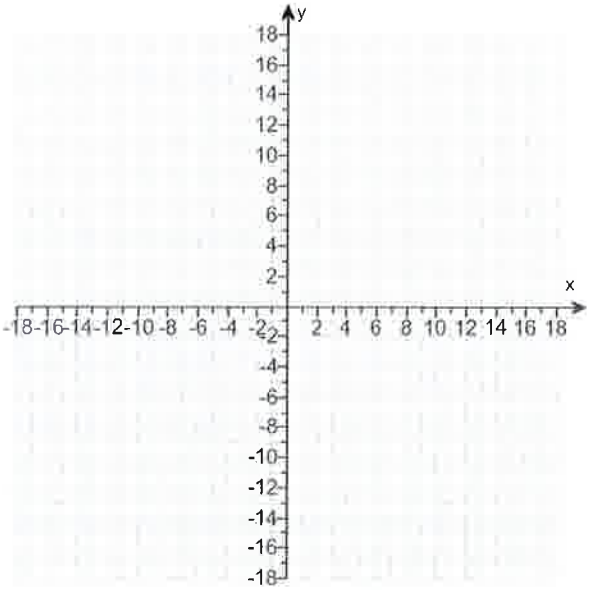
windows
x-min = −12
x-max = 12
y-min = −10
y-max = 10

ID: 2.3.89

82.

a. Graph the following function using transformations.
b. Find the real zeros of the function.
c. Determine the x-intercepts on the graph of the function.

$f(x) = 3(x+6)^2 - 3$



a. Graph the function using transformations.

b. What are the zeros of the function?

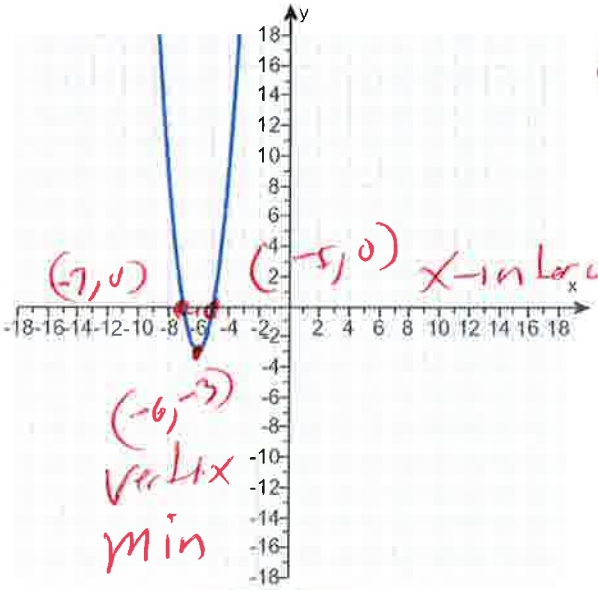
(Simplify your answer. Use a comma to separate answers as needed.)

c. What are the x-intercepts?

(Simplify your answer. Use a comma to separate answers as needed.)

$f(x) = 3(x+6)^2 - 3$
shift left −6 opposite
shift down −3

Answers



x-intercepts (−7, 0) (−5, 0) x-intercepts
(−6, −3)
vertex
min

x	f(x)
−7	0
−6	−3
−5	0

vertex

Use graphing calculator

$y_1 = 3(x+6)^2 - 3$

BIG

windows
x-min = −12
x-max = 12
y-min = −12
y-max = 12

−5, −7

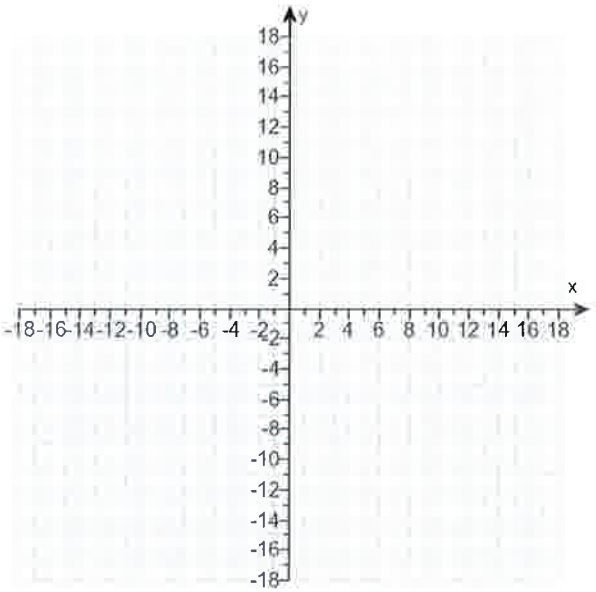
−5, −7

ID: 2.3.91

83.

a. Graph the following function using transformations.
b. Find the real zeros of the function.
c. Determine the x-intercepts on the graph of the function.

$$H(x) = -2(x-4)^2 + 2$$



a. Graph the function using transformations.

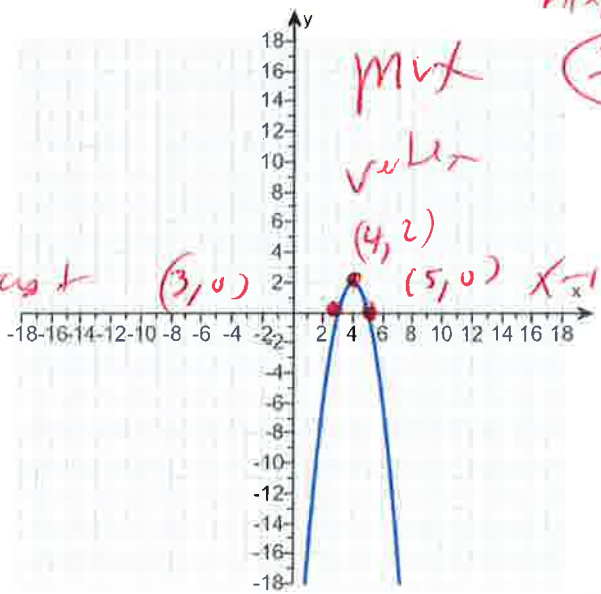
b. What are the zeros of the function?

(Simplify your answer. Use a comma to separate answers as needed.)

c. What are the x-intercepts?

(Simplify your answer. Use a comma to separate answers as needed.)

Answers



5,3

5,3

ID: 2.3.93

84. Find the real solutions of the following equation.

$8x^2 - 2x - 15 = 0$

Select the correct choice below and, if necessary, fill in the answer box to complete your answer.

- A. The real solutions are _____.
  (Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)
- B. There are no real solutions.

Answer: A. The real solutions are $-\frac{5}{4}, \frac{3}{2}$.

(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

ID: 2.4.2

85. Match the graph with the following function.

$f(x) = x^2 + 16x + 64$

Choose the correct graph below.

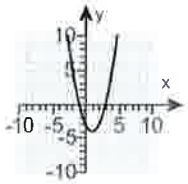
- A.
- B.
- C.
- D.

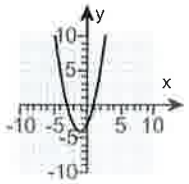
Answer: B.

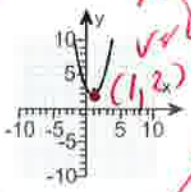
ID: 2.4.15

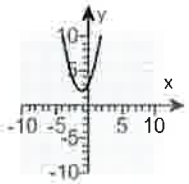
86. Match the function $f(x) = x^2 - 2x + 3$ to one of the given graphs.

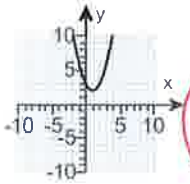
Choose the correct graph below.

A. 

B. 

C. 

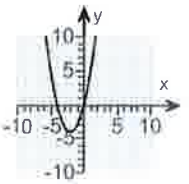
D. 

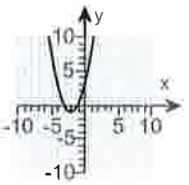
Answer: C. 

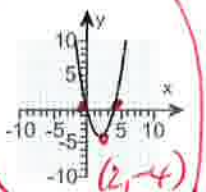
ID: 2.4.17

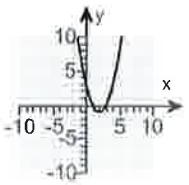
87. Match the function $f(x) = x^2 - 4x$ to one of the given graphs.

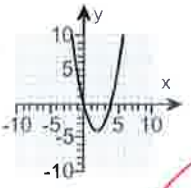
Choose the correct graph below.

A. 

B. 

C. 

D. 

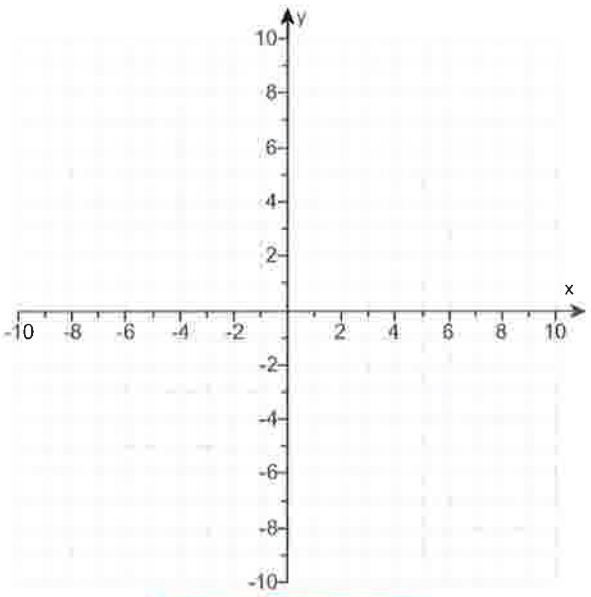
Answer: C. 

ID: 2.4.19

88.

Graph the function $f(x) = x^2 + 6x + 4$ by starting with the graph of $y = x^2$ and using transformations (shifting, stretching/compressing, and/or reflecting).

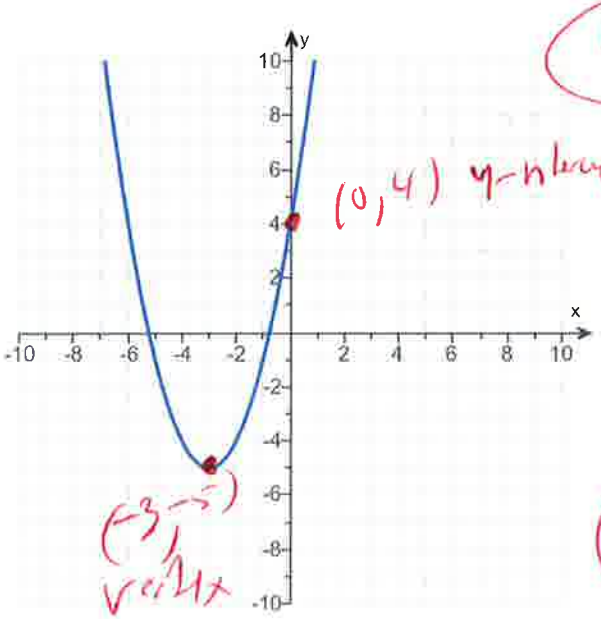
Use the graphing tool to graph the function.



$f(x) = x^2 + 6x + 4$

x	f(x)
-3	-5
0	4

Answer:



(0, 4) y-intercept

(-3, -5) vertex

min

Use graphing calculator

$y_1 = x^2 + 6x + 4$

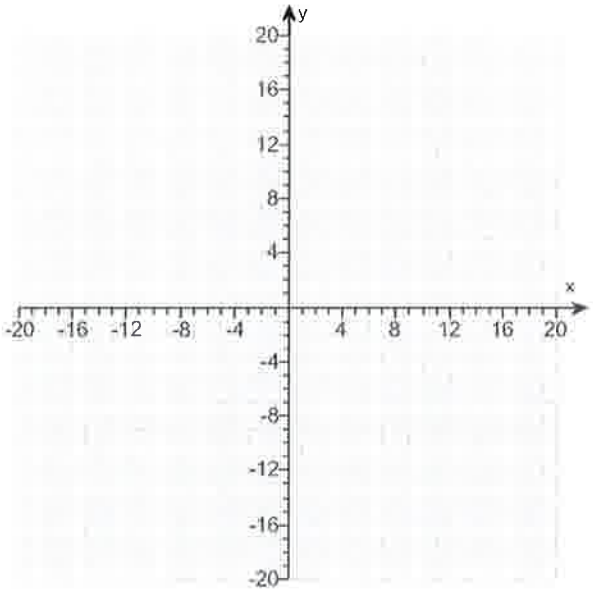
Windows

X-min = -12
X-max = 12
Y-min = -10
Y-max = 10

ID: 2.4.25

89.

Graph the function $f(x) = -x^2 + 2x$ by starting with the graph of $y = x^2$ and using transformations (shifting, stretching/compressing, and/or reflecting).

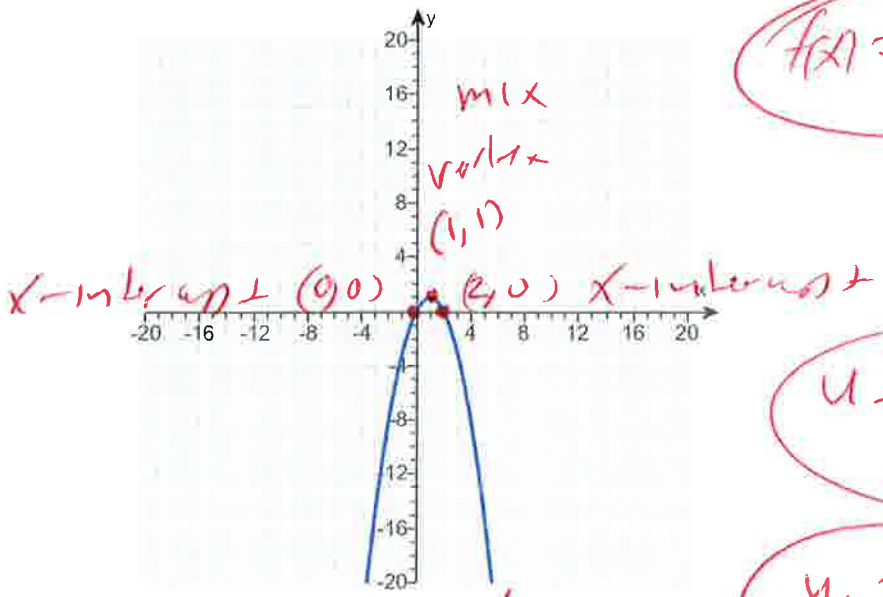


Select all the transformations needed to graph the given function using $y = x^2$.

- ☐ **A.** Reflect the graph about the x-axis.
- ☐ **B.** Shift the graph down 1 unit.
- ☐ **C.** Reflect the graph about the y-axis.
- ☐ **D.** Shift the graph to the left 1 unit.
- ☐ **E.** Stretch the graph vertically by a factor of 1.
- ☐ **F.** Shift the graph up 1 unit.
- ☐ **G.** Shift the graph to the right 1 unit.
- ☐ **H.** Compress the graph vertically by a factor of 1.

Use the graphing tool to graph the function.

Answers A. Reflect the graph about the x-axis., F. Shift the graph up 1 unit., G. Shift the graph to the right 1 unit.



$f(x) = -x^2 + 2x$

x	f(x)
0	0
1	1
2	0

use graphing calculator

$y_1 = -x^2 + 2x$

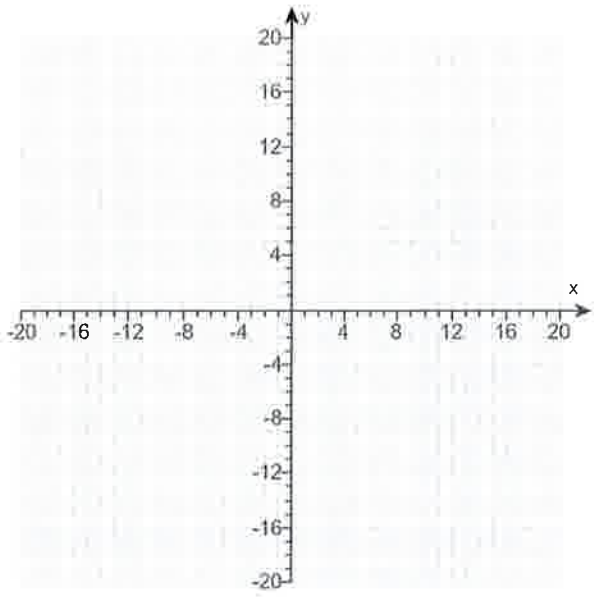
Windows
x-min = -12
x-max = 12
y-min = -10
y-max = 10

ID: 2.4.29-Setup & Solve

90. NEXT PAGE

40.

For the quadratic function $f(x) = x^2 - 2x - 8$, answer parts **(a)** through **(c)**.



(a) Graph the quadratic function by determining whether its graph opens up or down and by finding its vertex, axis of symmetry, y-intercept, and x-intercepts, if any.

Does the graph of f open up or down?

- ○ up
- ○ down

What are the coordinates of the vertex?

The vertex of the parabola is ____.
(Type an ordered pair. Use integers or fractions for any numbers in the expression.)

What is the equation of the axis of symmetry?

The axis of symmetry is ____.
(Type an equation.)

What is/are the x-intercept(s)? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The x-intercept(s) is/are ____.
  (Type an integer or a decimal. Use a comma to separate answers as needed.)
- ○ **B.** There are no x-intercepts.

What is the y-intercept? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The y-intercept is ____.
  (Type an integer or a decimal.)
- ○ **B.** There is no y-intercept.

Use the graphing tool to graph the function.

(b) Determine the domain and the range of the function.

The domain of f is ____.
(Type your answer in interval notation.)

The range of f is ____.
(Type your answer in interval notation.)

(c) Determine where the function is increasing and where it is decreasing.

The function is increasing on the interval ____.
(Type your answer in interval notation.)

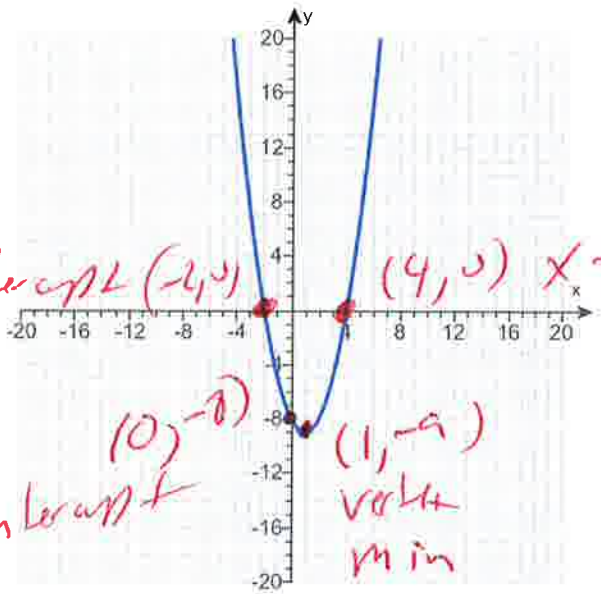
Answers up

(1, − 9)

x = 1

A. The x-intercept(s) is/are **4, − 2** .
(Type an integer or a decimal. Use a comma to separate answers as needed.)

A. The y-intercept is **− 8** .(Type an integer or a decimal.)



$f(x) = x^2 - 2x - 8$

x	f(x)
-2	0
0	-8
1	-9
4	0

x-intercept (-2,0) (4,0) x-intercept

(0,-8) y-intercept (1,-9) vertex min

vertex

Use Graphing Calculator.

$y_1 = x^2 - 2x - 8$

(− ∞,∞)

[− 9,∞)

[1,∞)

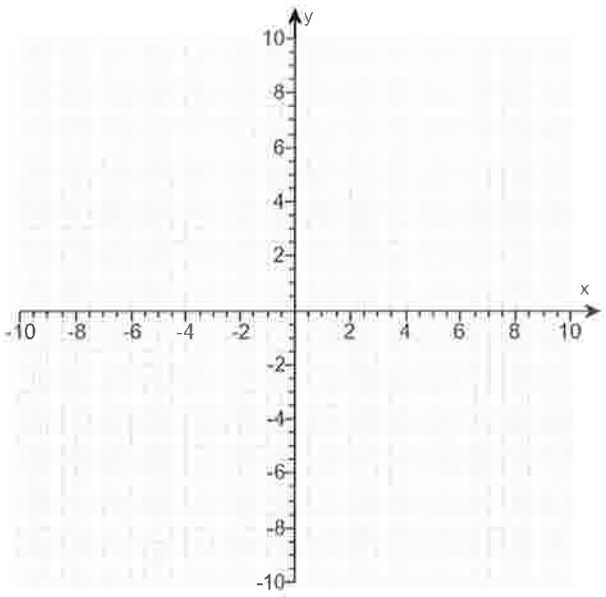
(− ∞,1]

Window:
X-min = -12
X-max = 12
Y-min = -10
Y-max = 10

ID: 2.4.37

91.

For the quadratic function $f(x) = -2x^2 + 2x - 3$, answer parts **(a)** through **(c)**. Verify the results using a graphing utility.



(a) Graph the quadratic function by determining whether its graph opens up or down and by finding its vertex, axis of symmetry, y-intercept, and x-intercepts, if any.

The graph of f opens (1) _____

The vertex of f is _____.
(Type an ordered pair.)

The axis of symmetry is _____.
(Type an equation. Simplify your answer.)

Determine the y-intercept. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The y-intercept is _____.
  (Type an integer or a decimal.)
- ○ **B.** There is no y-intercept.

Determine the x-intercept(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The x-intercept(s) is/are _____.
  (Type an integer or a decimal rounded to two decimal places as needed. Use a comma to separate answers as needed.)
- ○ **B.** There is no x-intercept.

Use the graphing tool to graph the function.

(b) Determine the domain and the range of the function.

The domain of f is _____.
(Type your answer in interval notation.)

The range of f is _____.
(Type your answer in interval notation.)

(c) Determine where the function is increasing and where it is decreasing.

The function is increasing on the interval _____.
(Type your answer in interval notation.)

The function is decreasing on the interval _____.
(Type your answer in interval notation.)

(1) ○ up.
○ down.

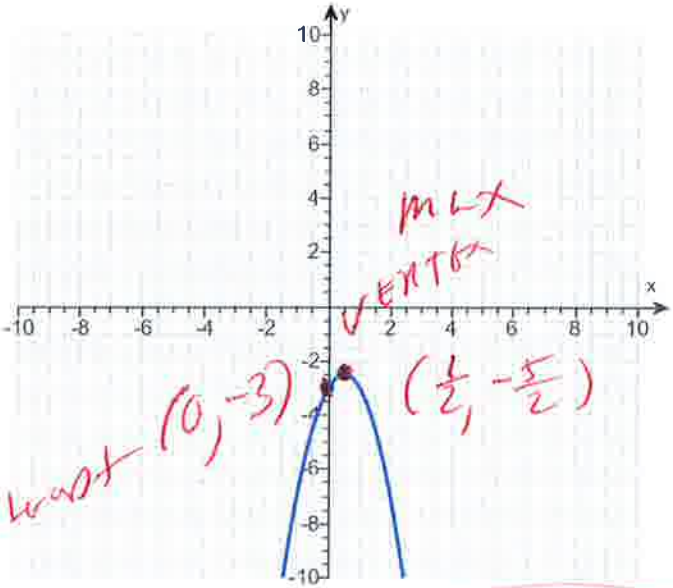
Answers (1) down.

$\left(\frac{1}{2}, -\frac{5}{2}\right)$

$x = \frac{1}{2}$

A. The y-intercept is **−3** .(Type an integer or a decimal.)

B. There is no x-intercept.



$(-\infty, \infty)$

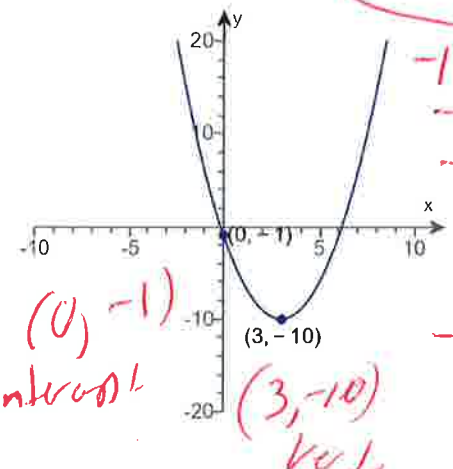
$\left(-\infty, -\frac{5}{2}\right]$

$\left(-\infty, \frac{1}{2}\right]$

$\left[\frac{1}{2}, \infty\right)$

ID: 2.4.43

92. Determine the quadratic function whose graph is given below.

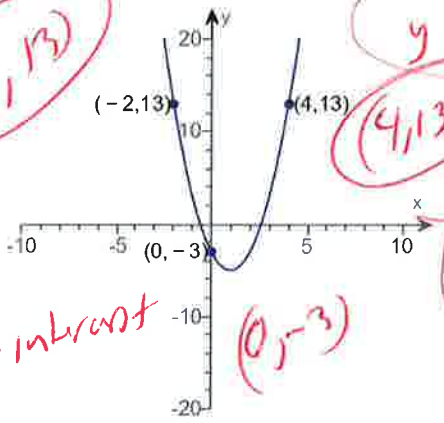


The quadratic function which describes the given graph is f(x) = _____.
(Type an expression.)

Answer: $x^2 - 6x - 1$

ID: 2.4.49

93. Determine the quadratic function whose graph is given below.



The quadratic function which describes the given graph is f(x) = _____.
(Type an expression.)

Answer: $2x^2 - 4x - 3$

ID: 2.4.53

94. Determine, without graphing, whether the given quadratic function has a maximum value or a minimum value and then find the value.

$f(x) = -3x^2 + 12x - 8$

graph opens down (Max)

$vertex = \left(\frac{-b}{2a}, f\left(\frac{b}{2a}\right)\right)$

Does the quadratic function f have a minimum value or a maximum value?

- ○ The function f has a minimum value.
- ○ The function f has a maximum value.

$f(x) = -3x^2 + 12x - 8$

$a = -3, \quad b = 12, \quad c = -8$

What is this minimum or maximum value?

$vertex = \left(\frac{-(12)}{2(-3)}, f\left(\frac{(12)}{2(-3)}\right)\right)$

(Simplify your answer.)

Answers The function f has a maximum value.

4

$Vertex = \left(\frac{-12}{-6}, f\left(\frac{-12}{-6}\right)\right)$

ID: 2.4.59

$Vertex = (4, f(4))$

$Vertex = (4, -3(4)^2 + 12(4) - 8)$

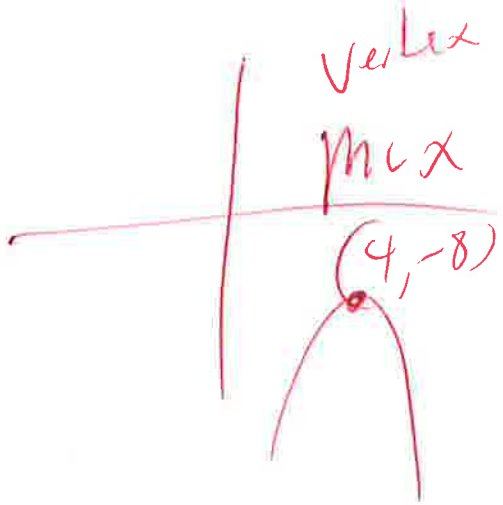
$Vertex = (4, -3(4)(4) + 12(4) - 8)$

$Vertex = (4, -3(16) + 12(4) - 8)$

$Vertex = (4, -48 + 48 - 8)$

$Vertex = (4, -8)$

Max



95. Find the complex zeros of the quadratic function. Graph the function and label the intercepts.

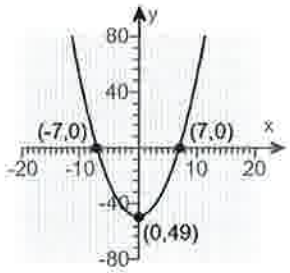
$f(x) = x^2 - 14x + 58$

The zeros of the function are ____.

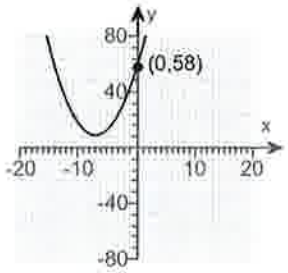
(Simplify your answer, including any radicals and i as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

Choose the correct graph below.

○ **A.**

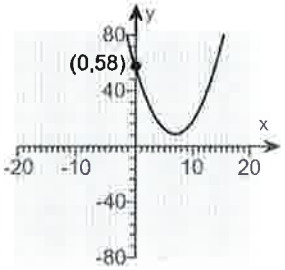


○ **B.**



◉ **C.**

Answers $7 - 3i, 7 + 3i$

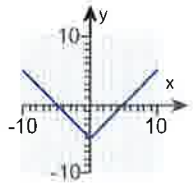


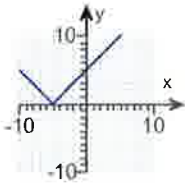
C.

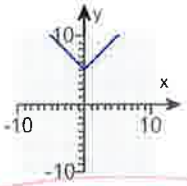
ID: 2.7.13

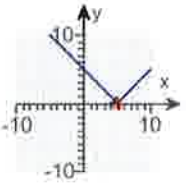
96. Use transformations to graph the function $h(x) = |x - 5|$.

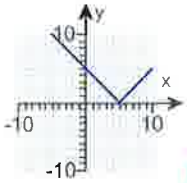
Choose the correct graph of $h(x) = |x - 5|$ below.

A. 

B. 

C. 

D. 

Answer: 

D.

ID: 2.8.6

97. Find the real solutions of the equation.

$|9x + 6| = 7$

Select the correct choice below and fill in any answer boxes within your choice.

A. The solution set is { }. (Use a comma to separate answers as needed.)
B. The solution set is all real numbers.
C. The solution set is the empty set.

Answer: A. The solution set is $\left\{\frac{1}{9}, -\frac{13}{9}\right\}$. (Use a comma to separate answers as needed.)

ID: 2.8.19

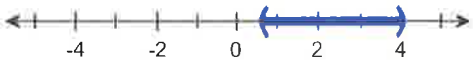
98. Solve the absolute value inequality. Graph the solution set.

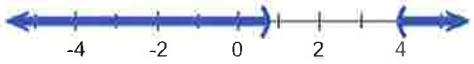
$|3t-7| \le 5$

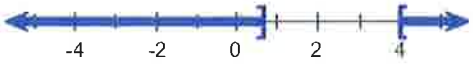
Select the correct choice below and fill in any answer boxes within your choice.

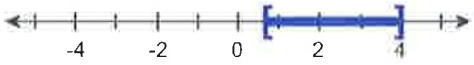
- **A.** The solution set in interval notation is _____.
  (Type your answer in interval notation. Use integers or fractions for any numbers in the expression.)
- **B.** The solution is the empty set.

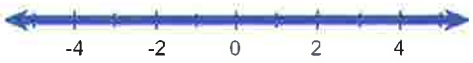
Graph the solution set. Choose the correct answer below.

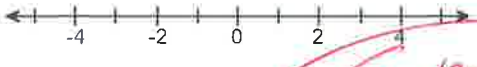
- **A.** 

- **B.** 

- **C.** 

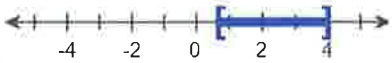
- **D.** 

- **E.** 

- **F.** 

Answers A. The solution set in interval notation is $\left[\frac{2}{3}, 4\right]$.

(Type your answer in interval notation. Use integers or fractions for any numbers in the expression.)

D. 

formula $|x| < a$

$-a < x < a$

ID: 2.8.49

$|3x-7| \le 5$

$-5 \le 3x-7 \le 5$

$-5+7 \le 3x-7+7 \le 5+7$

$2 \le 3x \le 12$

$\frac{2}{3} \le \frac{3x}{3} \le \frac{12}{3}$

$\frac{2}{3} \le x \le 4$

$\left[\frac{2}{3}, 4\right]$

99. Use the rational zeros theorem to find all the real zeros of the polynomial function. Use the zeros to factor f over the real numbers.

$f(x) = x^3 + 2x^2 - 5x - 6$

Find the real zeros of f. Select the correct choice below and, if necessary, fill in the answer box to complete your answer.

○ **A.** x = _____
(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any rational numbers in the expression. Use a comma to separate answers as needed.)

○ **B.** There are no real zeros.

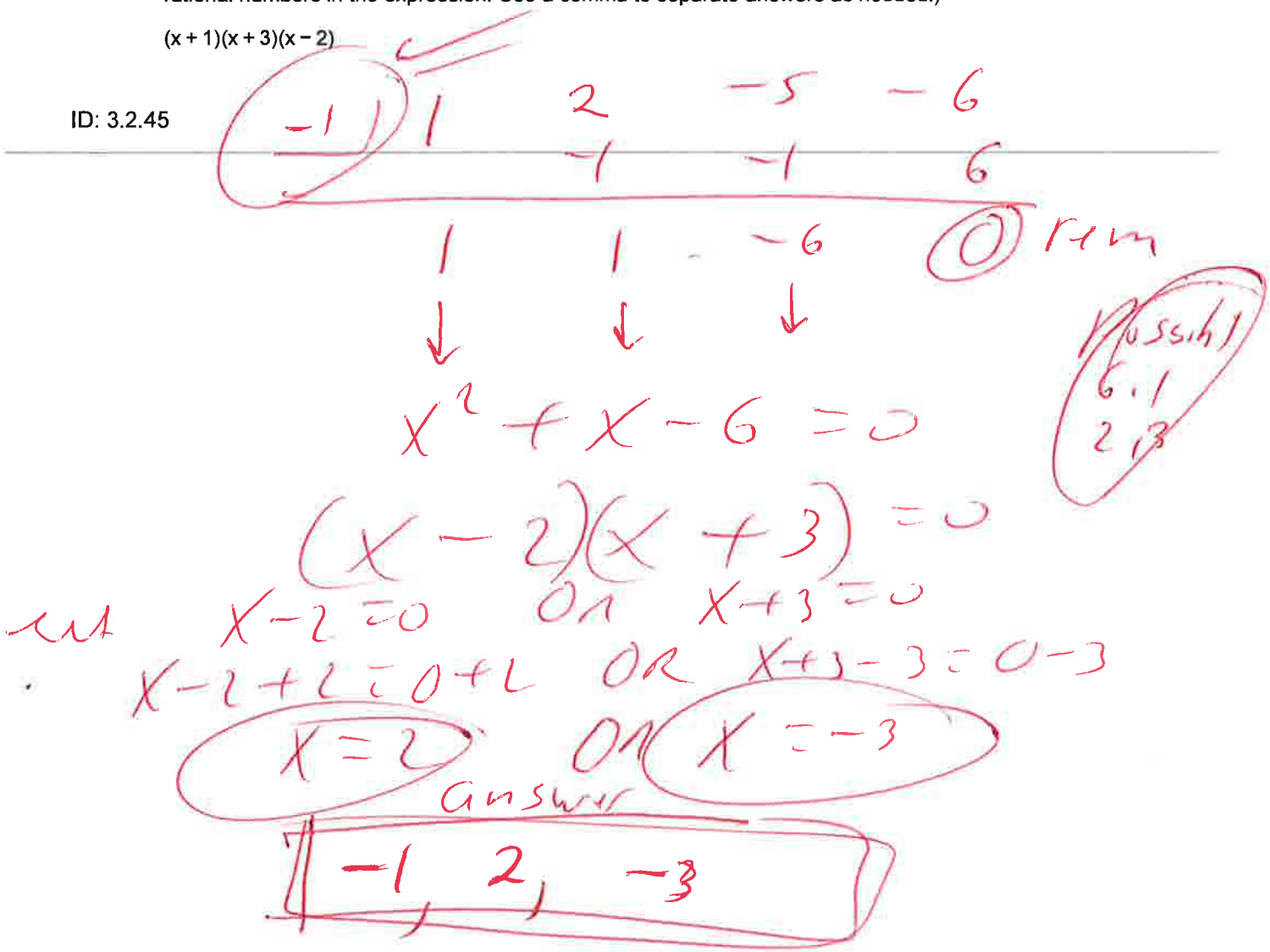
Use the real zeros to factor f.

f(x) = _____
(Simplify your answer. Type your answer in factored form. Type an exact answer, using radicals as needed. Use integers or fractions for any rational numbers in the expression.)

Answers A. x = **−3, −1, 2**
(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any rational numbers in the expression. Use a comma to separate answers as needed.)

$(x + 1)(x + 3)(x - 2)$

ID: 3.2.45



100. Use the rational zeros theorem to find all the real zeros of the polynomial function. Use the zeros to factor f over the real numbers.

$f(x) = x^4 + 10x^3 - 20x^2 - 90x + 99$

What are the real zeros? Select the correct choice below and, if necessary, fill in the answer box to complete your answer.

- **A.** x = _____
  (Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any rational numbers in the expression. Use a comma to separate answers as needed.)
- **B.** There are no real zeros.

Use the real zeros to factor f.

f(x) = _____

(Simplify your answer. Type your answer in factored form. Type an exact answer, using radicals as needed. Use integers or fractions for any rational numbers in the expression.)

Answers A. x = **−11,1,3,−3**

(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any rational numbers in the expression. Use a comma to separate answers as needed.)

$(x + 11)(x - 1)(x + 3)(x - 3)$

ID: 3.2.53

101. Solve the equation in the real number system.

$5x^4 - 26x^3 + 45x^2 - 28x + 4 = 0$

What are the real solutions of the equation? Select the correct choice below and fill in any answer boxes in your choice.

- **A.** x = _____
  (Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed. Type each answer only once; do not duplicate answers in the case of repeated roots.)
- **B.** There are no real solutions.

Answer: A. x = $\frac{1}{5}$, 2, 1

(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed. Type each answer only once; do not duplicate answers in the case of repeated roots.)

ID: 3.2.67

102. Find the domain of the following rational function.

$$R(x) = \frac{3x}{x+12}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The domain of R(x) is {x | _____}.
  (Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- **B.** The domain of R(x) is the set of all real numbers.

Answer: A. The domain of R(x) is {x | $x \neq -12$}.
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

ID: 3.4.15

$R(x) = \frac{3x}{x+12}$

$x+12=0$

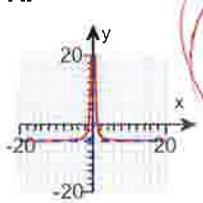
$x+12-12 = 0-12$

$x = -12$

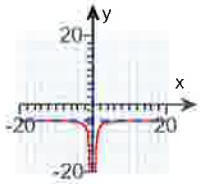
Domain $x \neq -12$

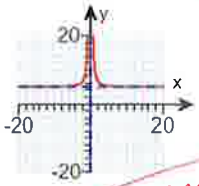
103. For the function $F(x) = \frac{5x^2 - 7}{x^2}$, (a) graph the rational function using transformations, (b) use the final graph to find the domain and range, and (c) use the final graph to list any vertical, horizontal, or oblique asymptotes.

(a) Choose the correct graph below.

○ A. 

● B. 

○ C. 

○ D. 

(b) What is the domain of the given function? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

○ A. The domain of the given function is $\{x|x \text{ is a real number, } x > \_\_\_\_\_\}$.
(Type an integer or a simplified fraction.)

○ B. The domain of the given function is $\{x|x \text{ is a real number, } x < \_\_\_\_\_\}$.
(Type an integer or a simplified fraction.)

● C. The domain of the given function is $\{x|x \text{ is a real number, } x \neq 0\}$.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

○ D. The domain of the given function is the set of all real numbers.

What is the range of the given function? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

● A. The range of the given function is $\{y|y \text{ is a real number, } y < 5\}$.
(Type an integer or a simplified fraction.)

○ B. The range of the given function is $\{y|y \text{ is a real number, } y > \_\_\_\_\_\}$.
(Type an integer or a simplified fraction.)

○ C. The range of the given function is $\{y|y \text{ is a real number, } y \neq \_\_\_\_\_\}$.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

○ D. The range of the given function is the set of all real numbers.

(c) What is/are the vertical asymptote(s)? Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

○ A. The left vertical asymptote is _____. The right vertical asymptote is _____.
(Type equations. Use integers or fractions for any numbers in the equations.)

● B. There is one vertical asymptote. It is $x = 0$.
(Type an equation. Use integers or fractions for any numbers in the equation.)

○ C. There is no vertical asymptote.

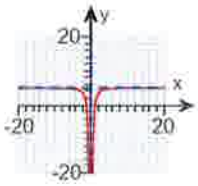
What is/are the horizontal asymptote(s)? Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

○ A. The top horizontal asymptote is _____. The bottom horizontal asymptote is _____.

_____.
(Type equations. Use integers or fractions for any numbers in the equations.)

What is/are the oblique asymptote(s)? Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

- **A.** There is one oblique asymptote. It is _____.
  (Type an equation. Use integers or fractions for any numbers in the equation.)
- **B.** The oblique asymptote with the positive slope is _____ and the oblique asymptote with the negative slope is _____.
  (Type equations. Use integers or fractions for any numbers in the equations.)
- **C.** There is no oblique asymptote.



Answers B.

C. The domain of the given function is $\{x|x$ is a real number, $x \neq$ **0** $\}$.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

A. The range of the given function is $\{y|y$ is a real number, $y <$ **5** $\}$.
(Type an integer or a simplified fraction.)

B. There is one vertical asymptote. It is **x = 0**.
(Type an equation. Use integers or fractions for any numbers in the equation.)

B. There is one horizontal asymptote. It is **y = 5**.
(Type an equation. Use integers or fractions for any numbers in the equation.)

C. There is no oblique asymptote.

ID: 3.4.43

104. Find the vertical, horizontal, and oblique asymptotes, if any, for the following rational function.

$$R(x) = \frac{10x}{x+10}$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. The vertical asymptote(s) is/are x = ______.
  (Use a comma to separate answers as needed.)
- B. There is no vertical asymptote.

Select the correct choice below and fill in any answer boxes within your choice.

- A. The horizontal asymptote(s) is/are y = ______.
  (Use a comma to separate answers as needed.)
- B. There is no horizontal asymptote.

Select the correct choice below and fill in any answer boxes within your choice.

- A. The oblique asymptote(s) is/are y = ______.
  (Use a comma to separate answers as needed.)
- B. There is no oblique asymptote.

Answers A. The vertical asymptote(s) is/are x = **− 10** .(Use a comma to separate answers as needed.)

A. The horizontal asymptote(s) is/are y = **10** .(Use a comma to separate answers as needed.)

B. There is no oblique asymptote.

ID: 3.4.45 $R(x) = \frac{10x}{x+10}$

set $x+10 = 0$

$x+10-10 = 0-10$

$x = -10$

vertical asymptote $x = -10$

$\frac{10x}{x} =$

$10 =$

horizontal asymptote $y = 10$

No oblique asymptote since power are same

top Bttm same

105. Find the vertical, horizontal, and oblique asymptotes, if any, for the given rational function.

$$R(x) = \frac{8x^2 + 6x - 9}{2x + 3}$$

$= \frac{(4x-3)(2x+3)}{(1)(2x+3)} = \frac{4x-3}{1} = 4x-3$

8.1 9.1 9.D 3.3

Select the correct choice below and fill in any answer boxes within your choice.

- A. The vertical asymptote(s) is/are x = _____.
  (Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)
- B. There is no vertical asymptote.

$R(x) = 4x-3$

no vertical asymptote

Select the correct choice below and fill in any answer boxes within your choice.

- A. The horizontal asymptote(s) is/are y = _____.
  (Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)
- B. There is no horizontal asymptote.

no horizontal asymptote

Select the correct choice below and fill in any answer boxes within your choice.

- A. The oblique asymptote(s) is/are y = _____.
  (Use a comma to separate answers as needed. Use integers or fractions for any numbers in the expression.)
- B. There is no oblique asymptote.

no oblique asymptote

Answers B. There is no vertical asymptote.

B. There is no horizontal asymptote.

B. There is no oblique asymptote.

ID: 3.4.53

106. The concentration C of a certain drug in a patient's bloodstream t hours after injection is given by

$$C(t) = \frac{t}{t^2 + 5}$$

(a) Find the horizontal asymptote of C(t).

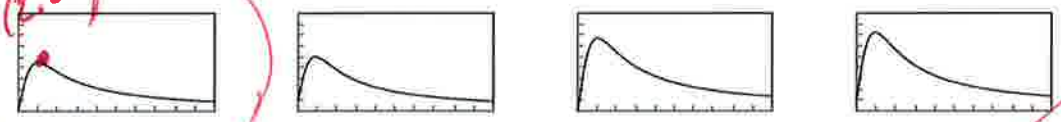
C = _____ (Simplify your answer.)

Determine what happens to the concentration of the drug as t increases. As t increases, what value will C(t) approach?

_____

(b) Which graph below is the graph of C(t), as displayed on a graphing utility? All four graphs use the following limits: [0, 22] by [0, 0.45], Xscl = 2.2, Yscl = 0.05.

○ A. ○ B. ○ C. ○ D.

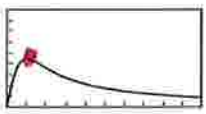


(c) Determine the time at which the concentration is highest.

t = _____ hours
(Round your answer to two decimal places.)

Answers 0

0



A.

2.24

ID: 3.5.63-GC

107. Evaluate the following expression, if possible.

$1296^{3/4}$

Select the correct choice below and fill in any answer boxes in your choice.

- A. $1296^{3/4}$ = _____
- B. The solution is not a real number.

Answer: A. $1296^{3/4}$ = **216**

ID: Quick Check P4.1.10

$1296^{3/4} =$

$((6)^4)^{3/4} =$

$6^{4(\frac{3}{4})} =$

$6^{\frac{12}{4}} =$

$6^3 =$

$6 \cdot 6 \cdot 6 =$

$216 =$

108. For f(x) = 7x + 5 and g(x) = 8x, find the following composite functions and state the domain of each.

(a) f ∘ g (b) g ∘ f (c) f ∘ f (d) g ∘ g

(a) (f ∘ g)(x) = _____ (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of f ∘ g is {x | _____}.
  (Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of f ∘ g is all real numbers.

(b) (g ∘ f)(x) = _____ (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of g ∘ f is {x | _____}.
  (Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of g ∘ f is all real numbers.

(c) (f ∘ f)(x) = _____ (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of f ∘ f is {x | _____}.
  (Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of f ∘ f is all real numbers.

(d) (g ∘ g)(x) = _____ (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of g ∘ g is {x | _____}.
  (Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of g ∘ g is all real numbers.

Answers 56x + 5

B. The domain of f ∘ g is all real numbers.

56x + 40

B. The domain of g ∘ f is all real numbers.

49x + 40

B. The domain of f ∘ f is all real numbers.

64x

B. The domain of g ∘ g is all real numbers.

ID: 4.1.23

109. For $f(x) = 8x + 6$ and $g(x) = x^2$, find the following composite functions and state the domain of each.

(a) $f \circ g$ (b) $g \circ f$ (c) $f \circ f$ (d) $g \circ g$

(a) $(f \circ g)(x) =$ ☐ (Simplify your answer.)

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The domain of $f \circ g$ is $\{x \mid$ ☐ $\}$.
  (Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $f \circ g$ is all real numbers.

(b) $(g \circ f)(x) =$ ☐ (Simplify your answer.)

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The domain of $g \circ f$ is $\{x \mid$ ☐ $\}$.
  (Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $g \circ f$ is all real numbers.

(c) $(f \circ f)(x) =$ ☐ (Simplify your answer.)

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The domain of $f \circ f$ is $\{x \mid$ ☐ $\}$.
  (Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $f \circ f$ is all real numbers.

(d) $(g \circ g)(x) =$ ☐ (Simplify your answer.)

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The domain of $g \circ g$ is $\{x \mid$ ☐ $\}$.
  (Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $g \circ g$ is all real numbers.

Answers $8x^2 + 6$

B. The domain of $f \circ g$ is all real numbers.

$64x^2 + 96x + 36$

B. The domain of $g \circ f$ is all real numbers.

$64x + 54$

B. The domain of $f \circ f$ is all real numbers.

x^4

B. The domain of $g \circ g$ is all real numbers.

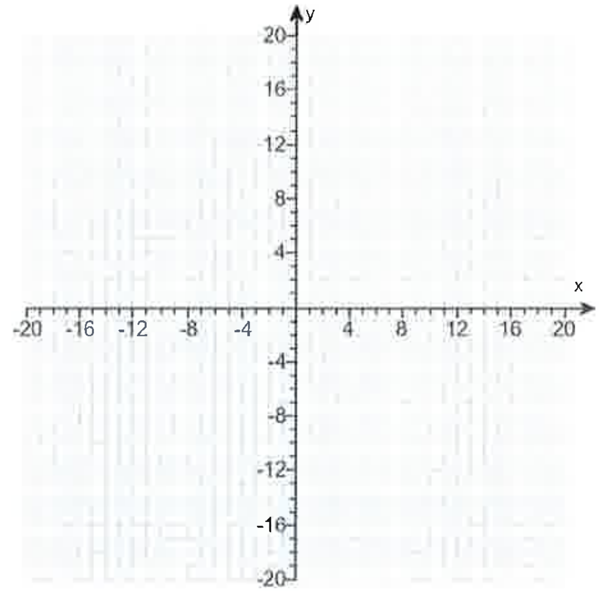
ID: 4.1.25

110.

NEXT Page

110

The function $f(x) = 3x - 1$ is one-to-one.
(a) Find the inverse of f and check the answer.
(b) Find the domain and the range of f and f^{-1}.
(c) Graph f, f^{-1}, and $y = x$ on the same coordinate axes.



(a) $f^{-1}(x) =$ ______
(Simplify your answer. Use integers or fractions for any numbers in the expression.)

(b) Find the domain of f. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The domain is $\{x|x \geq$ ______ $\}$.
- B. The domain is $\{x|x \neq$ ______ $\}$.
- C. The domain is $\{x|x \leq$ ______ $\}$.
- D. The domain is the set of all real numbers.

Find the range of f. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The range is $\{y|y \neq$ ______ $\}$.
- B. The range is $\{y|y \geq$ ______ $\}$.
- C. The range is $\{y|y \leq$ ______ $\}$.
- D. The range is the set of all real numbers.

Find the domain of f^{-1}. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The domain is $\{x|x \neq$ ______ $\}$.
- B. The domain is $\{x|x \leq$ ______ $\}$.
- C. The domain is $\{x|x \geq$ ______ $\}$.
- D. The domain is the set of all real numbers.

Find the range of f^{-1}. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The range is $\{y|y \neq$ ______ $\}$.
- B. The range is $\{y|y \geq$ ______ $\}$.
- C. The range is $\{y|y \leq$ ______ $\}$.
- D. The range is the set of all real numbers.

(c) Graph f, f^{-1}, and $y = x$ on the same coordinate axes. Use the graphing tool to graph the functions.

$f(x) = 3x - 1$
$y = 3x - 1$
$x = 3y - 1$
$x + 1 = 3y - 1 + 1$
$x + 1 = 3y$
$\frac{x+1}{3} = \frac{3y}{3}$
$\frac{x+1}{3} = y$
$y = \frac{x+1}{3}$
$f^{-1}(x) = \frac{x+1}{3}$

Set y =
INV var x−y
Solve for y
Inverse

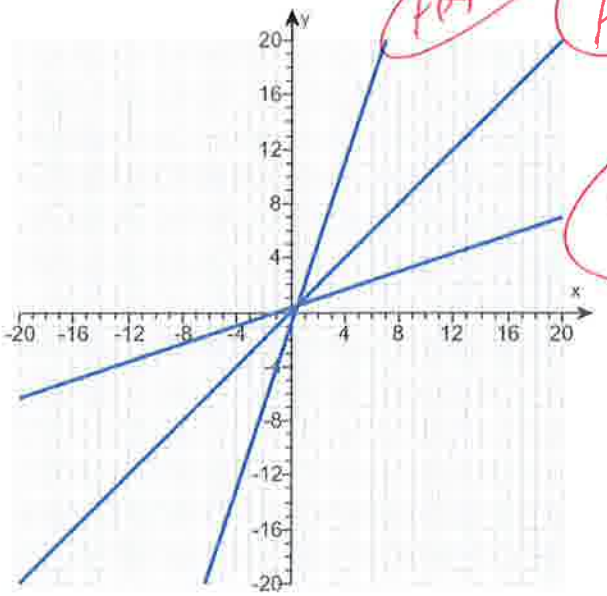
Answers $\frac{x+1}{3}$

D. The domain is the set of all real numbers.

D. The range is the set of all real numbers.

D. The domain is the set of all real numbers.

D. The range is the set of all real numbers.



$f(x) = 3x - 1$

$f(x) = x$

$f^{-1}(x) = \frac{x-1}{3}$

ID: 4.2.53

111. The function $f(x) = \frac{6}{5+x}$ is one-to-one.

(a) Find its inverse and check your answer. (b) Find the domain and the range of f and f^{-1}.

(a) $f^{-1}(x) =$ _____ (Simplify your answer.)

(b) Find the domain of f. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The domain is $\{x|x \leq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **B.** The domain is $\{x|x \neq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **C.** The domain is $\{x|x \geq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **D.** The domain is the set of all real numbers.

Find the range of f. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The range is $\{y|y \neq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **B.** The range is $\{y|y \geq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **C.** The range is $\{y|y \leq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **D.** The range is the set of all real numbers.

Now, find the domain of f^{-1}. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The domain is $\{x|x \leq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **B.** The domain is $\{x|x \geq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **C.** The domain is $\{x|x \neq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **D.** The domain is the set of all real numbers.

Find the range of f^{-1}. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The range is $\{y|y \geq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **B.** The range is $\{y|y \leq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **C.** The range is $\{y|y \neq$ _____$\}$.
  (Type integers or fractions. Use a comma to separate answers as needed.)
- ○ **D.** The range is the set of all real numbers.

Answers $\frac{6-5x}{x}$

B. The domain is $\{x|x \neq$ **−5** $\}$.
(Type integers or fractions. Use a comma to separate answers as needed.)

A. The range is $\{y|y \neq$ **0** $\}$.
(Type integers or fractions. Use a comma to separate answers as needed.)

C. The domain is $\{x|x \neq$ **0** $\}$.
(Type integers or fractions. Use a comma to separate answers as needed.)

C. The range is $\{y|y \neq$ **−5** $\}$.
(Type integers or fractions. Use a comma to separate answers as needed.)

ID: 4.2.63

$f(x) = \frac{6}{5+x}$

$y = \frac{6}{5+x}$

$x = \frac{6}{5+y}$

set y = inv var x-y

$x(5+y) = 1(6)$

$5x + xy = 6$

$5x + xy - 5x = 6 - 5x$

$xy = 6 - 5x$

$\frac{xy}{x} = \frac{6-5x}{x}$

$y = \frac{6-5x}{x}$

inverse

$f^{-1}(x) = \frac{6-5x}{x}$

112.

Use transformations to graph the function. Determine its domain, range, and horizontal asymptote.

$f(x) = 6^x + 1$

Use the graphing tool to graph the function.

(For any answer boxes shown with the grapher, type an exact answer.)

What is the domain of $f(x) = 6^x + 1$?

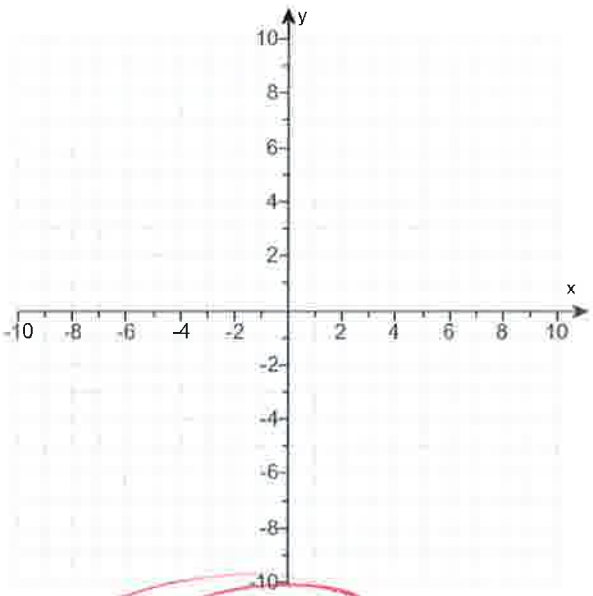
(Type your answer in interval notation.)

What is the range of $f(x) = 6^x + 1$?

(Type your answer in interval notation.)

What line is the horizontal asymptote of $f(x) = 6^x + 1$?

(Type an equation.)



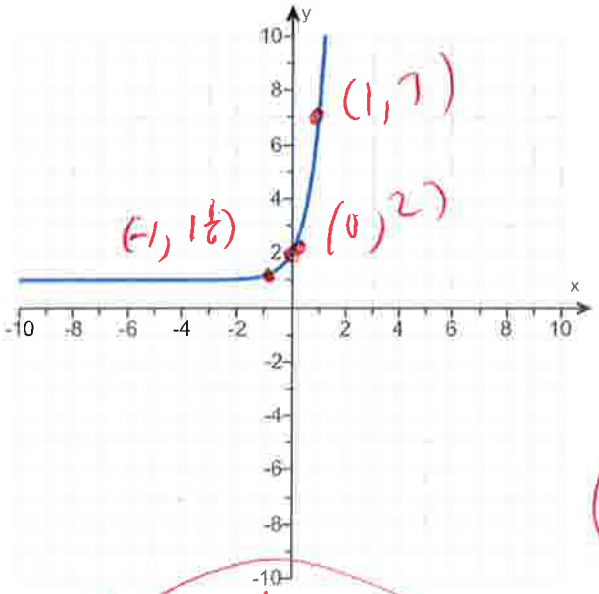
$f(x) = 6^x + 1$

x	f(x)
-1	1 1/6
0	2
1	7

Use graphing calculator

$y_1 = 6^x + 1$

Answers



$(-\infty, \infty)$

$(1, \infty)$

$y = 1$

window
x-min = -12
x-max = 12
y-min = -10
y-max = 10

ID: 4.3.43

113. Solve the equation.

$32^{-x+26} = 256^{x}$

The solution set is { }
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

Answer: 10

ID: 4.3.73

114. If a single pane of glass obliterates 3% of the light passing through it, the percent p of light that passes through n successive panes is given approximately by the function below.

$p(n) = 100(0.97)^{n}$

(a) What percent of light will pass through 10 panes?
(b) What percent of light will pass through 20 panes?
(c) Explain the meaning of the base 0.97 in this problem.

(a) The percent of light that will pass through 10 panes is approximately _____%.
(Round to the nearest whole number as needed.)

(a) The percent of light that will pass through 20 panes is approximately _____%.
(Round to the nearest whole number as needed.)

(c) Choose the correct answer below.

- A. Each pane allows only 0.03% of light to pass through.
- B. Each pane allows only 0.97% of light to pass through.
- C. Each pane allows only 97% of light to pass through.
- D. Each pane allows only 3% of light to pass through.

Answers 74

54

C. Each pane allows only 97% of light to pass through.

ID: 4.3.105

115. The price p, in dollars, of a specific car that is x years old is modeled by the function below.

$p(x) = 22{,}285(0.91)^x$

(a) How much should a 5-year-old car cost?
(b) How much should a 8-year-old car cost?
(c) Explain the meaning of the base 0.91 in this problem.

(a) A 5-year-old car should cost approximately $ _____.
(Round to the nearest whole number as needed.)

(b) A 8-year-old car should cost approximately $ _____.
(Round to the nearest whole number as needed.)

(c) Choose the correct answer below.

- **A.** As each year passes, the car is worth 0.91% of its value the previous year.
- **B.** As each year passes, the car is worth 0.09% of its value the previous year.
- **C.** As each year passes, the car is worth 9% of its value the previous year.
- **D.** As each year passes, the car is worth 91% of its value the previous year.

Answers 13,907

10,480

D. As each year passes, the car is worth 91% of its value the previous year.

ID: 4.3.107

$P(x) = 22{,}285(0.91)^x$

$P(5) = \$22{,}285(0.91)^5$

$= \$13{,}906.55635$

OR Round

$= \$13{,}907$

$P(8) = \$22285(0.91)^8$

$= \$10{,}479.57757$

OR

Round

$\$10{,}480$

116. The percentage of patients P who have survived t years after initial diagnosis of a certain disease is modeled by the function $P(t) = 100(0.3)^t$.

(a) According to the model, what percent of patients survive 1 year after initial diagnosis?
(b) What percent of patients survive 3 years after initial diagnosis?
(c) Explain the meaning of the base 0.3 in the context of this problem.

(a) According to the model, _____ % of patients survive 1 year after initial diagnosis.
(Type an integer or a decimal.)

(b) According to the model, _____ % of patients survive 3 years after initial diagnosis.
(Type an integer or a decimal.)

(c) Explain the meaning of the base 0.3 in the context of this problem. Select the correct choice below and fill in the answer box to complete your choice.

- A. As each year passes, _____ % of the previous survivors take the diagnosis.
- B. As each year passes, _____ % of the total patients have survived.
- C. As each year passes, _____ % of the previous year's survivors have survived.

$P(1) = 100(0.3)^1 = 30$

Answers 30

2.7

C. As each year passes, 30 % of the previous year's survivors have survived.

$P(3) = 100(0.3)^3 = 2.7$

ID: 4.3.109

117. The function

$D(h) = 8e^{-0.57h}$

can be used to find the number of milligrams D of a certain drug that is in a patient's bloodstream h hours after the drug has been administered. How many milligrams will be present after 1 hour? After 10 hours?

After 1 hour, there will be _____ milligrams. (Round to two decimal places as needed.)

After 10 hours, there will be _____ milligrams. (Round to two decimal places as needed.)

Answers 4.52

0.03

ID: 4.3.111

$D(1) = 8e^{1(-0.57(1))}$

$= 4.524203511$

OR

Round $= 4.52$

$D(10) = 8e^{1(-0.57(10))}$

$= 0.0026767237$

OR Round

$= 0.03$

118. Find the domain of the function.

$g(x) = \ln(x - 6)$

The domain of g is [ ].
(Type your answer in interval notation.)

Answer: $(6,\infty)$

ID: 4.4.39

119. Solve the following equation.

$\log_9 x = 2$

The solution set is { }.
(Simplify your answer.)

Answer: 81

ID: 4.4.89

120. Solve the equation.

$\log_2(2x + 3) = 3$

Change the given logarithmic equation to exponential form.

[ ]
(Type an equation. Do not simplify.)

The solution set is { }.
(Simplify your answer. Use a comma to separate answers as needed.)

Answers $2x + 3 = 2^3$

$\frac{5}{2}$

ID: 4.4.91-Setup & Solve

121. Solve the following equation. Write the answer in terms of the natural logarithm.

$e^{4x} = 2$

The solution set is { }.
(Type an exact answer in simplified form. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

Answer: $\frac{\ln 2}{4}$

ID: 4.4.101

122. The formula

$D = 10e^{-0.6h}$

can be used to find the number of milligrams D of a certain drug that is in a patient's bloodstream h hours after the drug was administered. When the number of milligrams reaches 4, the drug is to be administered again. What is the time between injections?

The time between injections is _____ hour(s).
(Type an integer or a decimal rounded to two decimal places as needed.)

Answer: 1.53

ID: 4.4.125

123. Write the expression as a sum and/or difference of logarithms. Express powers as factors.

$\log_2\left(\frac{x^7}{x-7}\right), x > 7$

$\log_2\left(\frac{x^7}{x-7}\right)$ = _____ (Simplify your answer.)

Answer: $7\log_2 x - \log_2(x-7)$

ID: 4.5.49

124. Write the expression as a sum and/or difference of logarithms. Express powers as factors.

$\log\left[\frac{x(x+3)}{(x+2)^6}\right]$, $x > 0$

$\log\left[\frac{x(x+3)}{(x+2)^6}\right] =$ _____ (Simplify your answer.)

Answer: $\log x + \log(x+3) - 6\log(x+2)$

ID: 4.5.51

125. Solve the following logarithmic equation.

$\log_2(7x) = 4$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { _____ }.
  (Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.)
- B. There is no solution.

Answer: A. The solution set is $\left\{\frac{16}{7}\right\}$.

(Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.)

ID: 4.6.7

126. Solve the logarithmic equation.

$\log_9(x+1) = \log_9 11$

Determine the equation to be solved after removing the logarithm.

[ ]

(Type an equation. Do not simplify.)

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { [ ] }.
  (Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.)
- B. There is no solution.

Answers $x + 1 = 11$

A. The solution set is { 10 }.
(Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.)

ID: 4.6.9-Setup & Solve

127. Solve the following logarithmic equation.

$\log x + \log(x+48) = 2$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { [ ] }.
  (Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.)
- B. There is no solution.

Answer: A. The solution set is { 2 }.
(Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.)

ID: 4.6.17

128. Solve the following logarithmic equation.

$\log(5x+9) = 1 + \log(x-7)$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }. (Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.
- B. There is no solution.

Answer: A. The solution set is $\left\{\frac{79}{5}\right\}$.

(Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.

ID: 4.6.19

129. Solve the logarithmic equation.

$\log_4(x+4) = 1 - \log_4(x+7)$

Determine the equation to be solved after removing the logarithm.

(Type an equation. Do not simplify.)

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }. (Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.
- B. There is no solution.

Answers $(x+4)(x+7) = 4$

A. The solution set is $\{-3\}$.

(Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.

ID: 4.6.23-Setup & Solve

130. Solve the following exponential equation. Express irrational solutions in exact form and as a decimal rounded to three decimal places.

$6^{x-6} = 36$

What is the exact answer? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The solution set is { }.
  (Simplify your answer. Type an exact answer.)
- ○ **B.** There is no solution.

What is the answer rounded to three decimal places? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The solution set is { }.
  (Simplify your answer. Type an integer or decimal rounded to three decimal places as needed.)
- ○ **B.** There is no solution.

Answers A. The solution set is {8}.(Simplify your answer. Type an exact answer.)

A. The solution set is {8.000}.
(Simplify your answer. Type an integer or decimal rounded to three decimal places as needed.)

ID: 4.6.41

$6^{x-6} = 36$

$6^{x-6} = 6^2$

$x - 6 = 2$

$x - 6 + 6 = 2 + 6$

$x = 8$

131. Solve the following exponential equation. Express irrational solutions in exact form and as a decimal rounded to three decimal places.

$8^x = 7$

What is the exact answer? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is {_____}.
  (Simplify your answer. Type an exact answer.)
- B. There is no solution.

What is the answer rounded to three decimal places? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is {_____}.
  (Simplify your answer. Type an integer or decimal rounded to three decimal places as needed.)
- B. There is no solution.

Answers A. The solution set is $\left\{\frac{\ln 7}{\ln 8}\right\}$.(Simplify your answer. Type an exact answer.)

A. The solution set is {0.936}.
(Simplify your answer. Type an integer or decimal rounded to three decimal places as needed.)

ID: 4.6.43

$8^x = 7$

$\ln(8^x) = \ln(7)$

$x \ln(8) = \ln(7)$

$\frac{x \ln(8)}{\ln(8)} = \frac{\ln(7)}{\ln(8)}$

$x = \frac{\ln(7)}{\ln(8)}$

OR Round

$x = 0.936$

OR

$x = .935784974$

132. Solve the following exponential equation. Express irrational solutions in exact form and as a decimal rounded to three decimal places.

$2^{-x} = 2.5$

$\ln(2^{-x}) = \ln(2.5)$

$-x\ln(2) = \ln(2.5)$

$\frac{-1x\ln(2)}{(-1\ln(2))} = \frac{\ln(2.5)}{(-1\ln(2))}$

$x = -1.321928095$

What is the exact answer? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }. (Simplify your answer. Type an exact answer.)
- B. There is no solution.

What is the answer rounded to three decimal places? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

OR Round

- A. The solution set is { }. (Simplify your answer. Type an integer or decimal rounded to three decimal places as needed.)
- B. There is no solution.

$x = -1.322$

Answers A. The solution set is $\{-\log_2 2.5\}$. (Simplify your answer. Type an exact answer.)

A. The solution set is $\{-1.322\}$.
(Simplify your answer. Type an integer or decimal rounded to three decimal places as needed.)

ID: 4.6.45

133. Find the amount that results from the given investment.

$A = P(1 + \frac{r}{n})^{nt}$ 4(3)

$P = 500$

$r = 8\% = .08$

$n = 4 =$ Quarter

$t = 3$ yrs

500 invested at 8% compounded quarterly after a period of 3 years

After 3 years, the investment results in $ [ ]. (Round to the nearest cent as needed.)

$A = 500(1 + \frac{.08}{4})^{12}$

$A = 500(1 + .08/4)^{12}$

Answer: 634.12

$A = 634.1208573$

OR

$A = 634.12$ Round

ID: 4.7.7

134. Find the amount that results from the given investment.

P

$r = 12\% = .12$

$n = 4 =$ Quarter

$t = 4\frac{1}{2} = 4.5$

$A = P(1 + \frac{r}{n})^{nt}$

$A = 200(1 + \frac{.12}{4})^{4(4.5)}$

200 invested at 12% compounded quarterly after a period of $4\frac{1}{2}$ years

After $4\frac{1}{2}$ years, the investment results in $ [ ]. (Round to the nearest cent as needed.)

$A = 200(1 + .12/4)^{18}$

Answer: 340.49

$A = 340.486122$

OR

$A = 340.49$ Round

ID: 4.7.9

135. Find the amount that results from the given investment.

$400 invested at 8% compounded daily after a period of 4 years

After 4 years, the investment results in $ _____.
(Round to the nearest cent as needed.)

Answer: 550.83

ID: 4.7.11

136. How many years will it take for an initial investment of $20,000 to grow to $70,000? Assume a rate of interest of 4% compounded continuously.

It will take about _____ years for the investment to grow to $70,000.
(Round to two decimal places as needed.)

Answer: 31.32

ID: 4.7.41

137. What will a $200,000 house cost 7 years from now if the price appreciation for homes over that period averages 3% compounded annually?

The future cost of the house will be $ _____.
(Do not round until the final answer. Then round to the nearest cent as needed.)

Answer: 245,974.77

ID: 4.7.43

138. Jerome will be buying a used car for $11,000 in 2 years. How much money should he ask his parents for now so that, if he invests it at 10% compounded continuously, he will have enough to buy the car?

Jerome should ask for $ _____.
(Round to the nearest cent as needed.)

Answer: 9,006.04

ID: 4.7.45

139. Trish invests $6,000 in her IRA in a bond trust that pays 12% interest compounded semiannually. Sean invests $6,000 in his IRA in a certificate of deposit that pays 11.7% compounded continuously. Who has more money after 20 years, Trish or Sean?

After 20 years, Trish will have $ _____. (Round to the nearest cent as needed.)

After 20 years, Sean will have $ _____. (Round to the nearest cent as needed.)

After 20 years, (1) _____ will have more money.

(1) ○ Trish
○ Sean

Answers 61,714.31

62,287.42

(1) Sean

ID: 4.7.51

Trish $A = P\left(1+\frac{r}{N}\right)^{N\cdot t}$ $2(20)$

$A = \$6000\left(1+\frac{.12}{2}\right)^{40}$

$A = \$6000(1+.12/2)^{40}$

$A = \$6000(1.06)^{40}$

$A = \$61714.30762$

OR

$A = \$61714.31$, Round

$P = \$6000$
$r = 12\% = .12$
$N = 2$ = Semiannual
$t = 20$ = Years

Sean $A = Pe^{rt}$

$A = \$6,000e^{.117(20)}$

$A = \$6,000e^{2.34}$

$A = \$6,000(10.38)$

$A = \$62,287.41938$

$P = \$6000$
$r = 11.7\% = .117$
Continuously
$t = 20$ = Years

More

Roach (example)

140. The size P of a certain insect population at time t (in days) obeys the function $P(t) = 800e^{0.03t}$.
(a) Determine the number of insects at t = 0 days.
(b) What is the growth rate of the insect population?
(c) What is the population after 10 days?
(d) When will the insect population reach 1200?
(e) When will the insect population double?

double

(a) What is the number of insects at t = 0 days?

_____ insects

(b) What is the growth rate of the insect population?

_____ %

(c) What is the population after 10 days?

Approximately _____ insects.
(Do not round until the final answer. Then round to the nearest whole number as needed.)

(d) When will the population reach 1200 insects?

In approximately _____ days.
(Do not round until the final answer. Then round to the nearest tenth as needed.)

(e) When will the insect population double?

In about _____ days.
(Do not round until the final answer. Then round to the nearest tenth as needed.)

Answers 800
3
1080
13.5
23.1

ID: 4.8.1

141. The half-life of carbon-14 is 5600 years. If a piece of charcoal made from the wood of a tree shows only 75% of the carbon-14 expected in living matter, when did the tree die?

The tree died about _____ years ago.
(Do not round until the final answer. Then round to the nearest whole number.)

Answer: 2324

ID: 4.8.11

142. After the release of radioactive material into the atmosphere from a nuclear power plant in a country in 1994, the hay in that country was contaminated by a radioactive isotope (half-life 5 days). If it is safe to feed the hay to cows when 11% of the radioactive isotope remains, how long did the farmers need to wait to use this hay?

The farmers needed to wait approximately _____ days for it to be safe to feed the hay to the cows.
(Round to one decimal place as needed.)

Answer: 15.9

ID: 4.8.21

143. Uninhibited growth can be modeled by exponential functions other than $A(t) = A_0 e^{kt}$. For example, if an initial population P_0 requires n units of time to triple, then the function $P(t) = P_0(3)^{\frac{t}{n}}$ models the size of the population at time t. An insect population grows exponentially. Complete the parts a through d below.

(a) If the population triples in 30 days, and 50 insects are present initially, write an exponential function of the form $P(t) = P_0(3)^{\frac{t}{n}}$ that models the population.

$P(t) =$ _____.

(b) What will the population be in 47 days?

The population in 47 days will be _____.
(Round to the nearest integer as needed.)

(c) When will the population reach 800?

The population will reach 800 in _____ days.
(Round to one decimal place as needed.)

(d) Express the model from part (a) in the form $A(t) = A_0 e^{kt}$.

$P(t) =$ _____
(Use integers or decimals for any numbers in the expression. Round to three decimal places as needed.)

Answers

$50(3)^{\frac{t}{30}}$

280

75.7

$50e^{0.037t}$

ID: 4.8.32-GC

144. Solve the system of equations. If the system has no solution, say that it is inconsistent.

$$\begin{cases} 4x - 2y = 4 \\ 10x + y = 22 \end{cases}$$

Select the correct choice below and, if necessary, fill in any answer boxes within your choice.

- **A.** The solution of the system is x = _____ and y = _____.
  (Type an integers or simplified fractions.)
- **B.** There are infinitely many solutions. Using ordered pairs, the solution can be written as $\{(x,y) \mid x =$ _____, y any real number$\}$.
  (Simplify your answer. Type an expression using y as the variable as needed.)
- **C.** The system is inconsistent.

Answer: A. The solution of the system is x = 2 and y = 2.
(Type an integers or simplified fractions.)

ID: 6.1.33

145. Solve the given system of equations. If the system has no solution, say that it is inconsistent.

$$\begin{cases} x - 2y + 3z = 14 \\ 2x + y + z = -2 \\ -3x + 2y - 2z = -6 \end{cases}$$

Select the correct choice below and fill in any answer boxes within your choice.

- **A.** The solution is x = _____, y = _____, and z = _____. (Type integers or simplified fractions.)
- **B.** There are infinitely many solutions. Using ordered triplets, they can be expressed as $\{(x,y,z) \mid x =$ _____, y = _____, z any real number$\}$.
  (Simplify your answers. Type expressions using z as the variable as needed.)
- **C.** There are infinitely many solutions. Using ordered triplets, they can be expressed as $\{(x,y,z) \mid x =$ _____, y any real number, z any real number$\}$.
  (Simplify your answer. Type an expression using y and z as the variables as needed.)
- **D.** The system is inconsistent.

Answer: A.
The solution is x = −2, y = −2, and z = 4. (Type integers or simplified fractions.)

ID: 6.1.45

146. Write down the first five terms of the sequence.

$\left\{\frac{n}{n+3}\right\}$

Type the first five terms of the sequence $\{a_n\} = \left\{\frac{n}{n+3}\right\}$. Assume $n \geq 1$.

$a_1 =$ [ ] (Simplify your answer.)

$a_2 =$ [ ] (Simplify your answer.)

$a_3 =$ [ ] (Simplify your answer.)

$a_4 =$ [ ] (Simplify your answer.)

$a_5 =$ [ ] (Simplify your answer.)

$a_1 = \frac{1}{1+3} = \frac{1}{4}$ ✓

$a_2 = \frac{2}{2+3} = \frac{2}{5}$ ✓

$a_3 = \frac{3}{3+3} = \frac{3}{6} = \frac{3(1)}{3(2)} = \frac{1}{2}$ ✓

$a_4 = \frac{4}{4+3} = \frac{4}{7}$ ✓

Answers $\frac{1}{4}$

$\frac{2}{5}$

$\frac{1}{2}$

$\frac{4}{7}$

$\frac{5}{8}$

ID: 7.1.17

147. Expand the expression using the Binomial Theorem.

$(3p+1)^4$

$(3p+1)^4 =$ [ ] (Simplify your answer.)

Answer: $81p^4 + 108p^3 + 54p^2 + 12p + 1$

ID: 7.5.21

Use Stripby calculator

4, math, PRB, nCR, enter, 0, enter = 1

4, math, PRB, nCR, enter, 1, enter = 4

4, math, PRB, nCR, enter, 2, enter = 6

4, math, PRB, nCR, enter, 3, enter = 4

4, math, PRB, nCR, enter, 4, enter = 1

$\binom{4}{0}(3p)(1) + \binom{4}{1}(3p)(1) + \binom{4}{2}(3p)(1) + \binom{4}{3}(3p)(1) + \binom{4}{4}(3p)(1) =$

$(1)(3^4p^4)(1) + (4)(3^3p^3)(1) + (6)(3^2p^2)(1) + (4)(3^1p^1)(1) + (1)(1)(1) =$

$(1)(81p^4)(1) + (4)(27p^3)(1) + (6)(9p^2)(1) + 4(3p)(1) + (1)(1)(1) =$

$81p^4 + 108p^3 + 54p^2 + 12p + 1 =$

exponential growth