10-01-19
10-03-19

| Student: ____________ | Instructor: Alfredo Alvarez | Assignment: |
|---|---|---|
| Date: ____________ | Course: Math 1314 Alvarez | M1314COFIESTAFINALPRACTICE025MM |

10-05-19
10-07-19

1. Solve the equation by factoring.

$46 - 46x = (7x+3)(x-1)$

$46-46x = 7x^2-7x+3x-3$
$46-46x = 7x^2-4x-3$
$0 = 7x^2-4x-3-46+46x$
$0 = 7x^2+42x-49$

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

$0 = 7(x^2+6x-7)$

Answer: 1, −7

$0 = 7(x-1)(x+7)$
$\cancel{0=7}$ OR $x-1=0$ OR $x+7=0$
OR $x-1+1=0+1$ OR $x+7-7=0-7$
$x=1$ OR $x=-7$
ANSWER

ID: 1.5.13

2. Solve the equation by the method of your choice.

rewrite → $2x^2-11x-21=0$

$2x^2 - 11x = 21$

$a=2,\ b=-11,\ c=-21$

$x = \frac{11 \pm \sqrt{289}}{4}$

Use Quadratic formula

$x = \frac{11 \pm 17}{4}$

The solution set is { }.
(Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

formula → $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

Answer: $7, -\frac{3}{2}$

$x = \frac{11+17}{4}$ OR $x = \frac{11-17}{4}$

$x = \frac{-(-11) \pm \sqrt{(-11)^2-4(2)(-21)}}{2(2)}$ $x = \frac{28}{4}$ OR $x = \frac{-6}{4}$

$x=7$ OR $x = \frac{\cancel{2}(-3)}{\cancel{2}(2)}$
OR $x = \frac{-3}{2}$
ANSWER

ID: 1.5.83

$x = \frac{11 \pm \sqrt{121+168}}{4}$

3. Solve the given radical equation. Check all proposed solutions.

$\sqrt{3x+28} = x+8$

→ $(\sqrt{3x+28})^2 = (x+8)^2$
$3x+28 = (x+8)(x+8)$

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

$3x+28 = x^2+8x+8x+64$

A. The solution set is { } $3x+28 = x^2+16+64$
(Use a comma to separate answers as needed.)

B. There is no solution. $0 = x^2+16x+64-3x-28$
$0 = x^2+13x+36$

Answer: A. The solution set is { −4 }.(Use a comma to separate answers as needed.)

$0 = (x+4)(x+9)$

ID: 1.6.15

$x+4=0$ OR $x+9=0$

set

$x+4-4=0-4$ OR $x+9-9=0-9$
$x=-4$ OR $x=-9$

Check

$\sqrt{3x+28} = x+8$
$\sqrt{3(-4)+28} = (-4)+8$
$\sqrt{-12+28} = -4+8$
$\sqrt{16} = 4$
$4=4$
Good

$\sqrt{3x+28} = x+8$
$\sqrt{3(-9)+28} = (-9)+8$
$\sqrt{-27+28} = -9+8$
$\sqrt{1} = -1$
$1 \neq -1$
BAD

answer
$\boxed{-4}$

4.

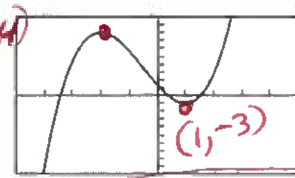
The graph and equation of the function f are given.

**a.** Use the graph to find any values at which f has a relative maximum, and use the equation to calculate the relative maximum for each value.

**b.** Use the graph to find any values at which f has a relative minimum, and use the equation to calculate the relative minimum for each value.

$f(x) = 2x^3 + 3x^2 - 12x + 4$

relative max (-2, 24)




relative min

[ − 5,5,1] by [ − 30,30,3]

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

○ **A.** The function f has (a) relative maxima(maximum) at ______ and the relative maxima(maximum) are(is) ______.
(Use a comma to separate answers as needed.)

○ **B.** The function f has no relative maxima.

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

○ **A.** The function f has (a) relative minima(minimum) at ______ and the relative minima(minimum) are(is) ______.
(Use a comma to separate answers as needed.)

○ **B.** The function f has no relative minima.

Answers A.

The function f has (a) relative maxima(maximum) at **− 2** and the relative maxima(maximum) are(is) **24**.
(Use a comma to separate answers as needed.)

A.

The function f has (a) relative minima(minimum) at **1** and the relative minima(minimum) are(is) **− 3**.
(Use a comma to separate answers as needed.)

use a graphing calculator BTC

$Y_1 = 2x^3 + 3x^2 - 12x + 4$

ID: 2.2.15

windows
x-min = -5
x-max = 5
y-min = -30
y-max = 30

relative max = (-2, 24)

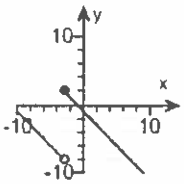
relative min = (1, -3)

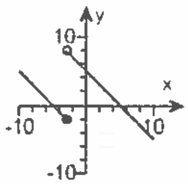
Answer

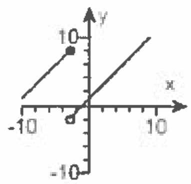
5. The domain of the piecewise function is $(-\infty,\infty)$.
**a.** Graph the function.
**b.** Use your graph to determine the function's range.

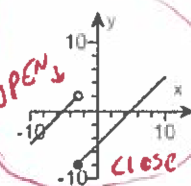
$$f(x)=\begin{cases} x+5 & \text{if } x<-3 \\ x-5 & \text{if } x\geq -3 \end{cases}$$

**a.** Choose the correct graph below.

A.



B.



C.



D.



OPEN

close

answer

**b.** The range of f(x) is ______. (Type your answer in interval notation.)

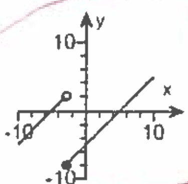
2ND MATH

$Y_1 = X+5 \div (X<-3)$ OPEN Circle

2ND MATH

$Y_2 = X-5 \div (X\geq -3)$ Close Circle

Answers




D.

$(-\infty,\infty)$

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

Use a graphing calculator

ID: 2.2.47

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6. 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.

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

$\frac{f(x+h)-f(x)}{h}=$ ______ (Simplify your answer.)

Answer: $2x+h-2$

ID: 2.2.61

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

$$\frac{((x+h)^2-2(x+h)+6)-(x^2-2x+6)}{h}=$$

$$\frac{(x+h)(x+h)-2x-2h+6-x^2+2x-6}{h}=$$

$$\frac{x^2+xh+xh+h^2-2x-2h+6-x^2+2x-6}{h}=$$

$$\frac{x^2+2xh+h^2-2x-2h+6-x^2+2x-6}{h}=$$

$$\frac{2xh+h^2-2h}{h}=$$

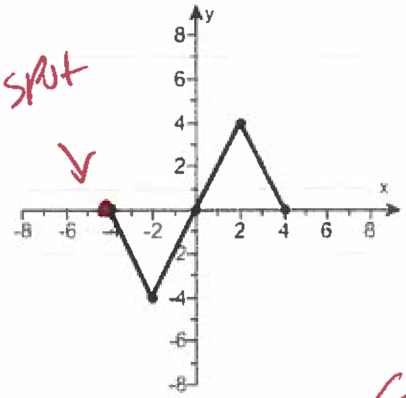
$$\frac{2xh}{h}+\frac{h^2}{h}-\frac{2h}{h}=$$

ANSWER

$2x+h-2$

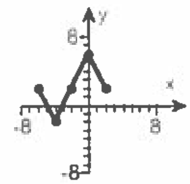
7. Use the graph of $y = f(x)$ to graph the function $g(x) = f(x - 2) - 2$.

OLD SPOT

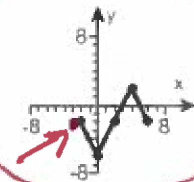



Choose the correct graph of ~~g below~~.

A.



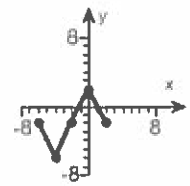
B.



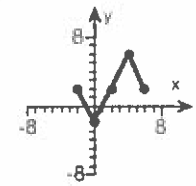
NEW SPOT

Answer

C.



D.



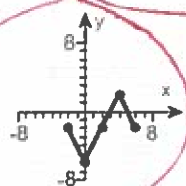
$g(x) = f(x - 2) - 2$

shift 2 right

OPPOSITE

Shift down $-2$

Answer:



B.

ID: 2.5.21

8. Find the domain of the function.

$f(x) = \sqrt{18 - 2x}$

What is the domain of f?

(Type your answer in interval notation.)

Answer: $(-\infty, 9]$

ID: 2.6.23

formula domain

$f(x) = \sqrt{Ax + B}$

set $Ax + B \geq 0$

$f(x) = \sqrt{18 - 2x}$

set $18 - 2x \geq 0$

$\cancel{18} - 2x - \cancel{18} \geq 0 - 18$

$-2x \geq -18$

$\frac{-2x}{-2} \leq \frac{-18}{-2}$

divide by a negative turn alligator around

$x \leq 9$

OR

9

OR

$(-\infty, 9]$

ANSWERS

9. For $f(x) = 2 - x$ and $g(x) = 4x^2 + x + 4$, find the following functions.

**a.** $(f \circ g)(x)$; **b.** $(g \circ f)(x)$; **c.** $(f \circ g)(3)$; **d.** $(g \circ f)(3)$

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

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

**c.** $(f \circ g)(3) =$ ____

**d.** $(g \circ f)(3) =$ ____

Answers $-4x^2 - x - 2$

$4x^2 - 17x + 22$

$-41$

$7$

ID: 2.6.59

$(f \circ g)(x) =$
$f(g(x)) =$
$f(4x^2 + x + 4) =$
$2 - (4x^2 + x + 4) =$
$2 - 4x^2 - x - 4 =$
$-4x^2 - x - 2 =$
answer

$(g \circ f)(x) =$
$g(f(x)) =$
$g(2 - x) =$
$4(2-x)^2 + (2-x) + 4 =$
$4(2-x)(2-x) + (2-x) + 4 =$
$4(4 - 2x - 2x + x^2) + (2-x) + 4 =$
$4(4 - 4x + x^2) + (2-x) + 4 =$
$16 - 16x + 4x^2 + 2 - x + 4 =$
$4x^2 - 17x + 22 =$
answer

$(f \circ g)(x) = -4x^2 - x - 2$
$(f \circ g)(3) = -4(3)^2 - (3) - 2$
$(f \circ g)(3) = -4(3)(3) - (3) - 2$
$(f \circ g)(3) = -36 - 3 - 2$
$(f \circ g)(3) = -41$
answer

$(g \circ f)(x) = 4x^2 - 17x + 22$ same
$g(f(x)) = 4x^2 - 17x + 22$
$(g \circ f)(3) = 4(3)^2 - 17(3) + 22$
$(g \circ f)(3) = 4(3)(3) - 17(3) + 22$
$(g \circ f)(3) = 36 - 51 + 22$
$(g \circ f)(3) = 7$
answer

10. Find the distance between the pair of points.

(8,7) and (20,16)

The distance between the points is ____ units.
(Round to two decimal places as needed.)

Answer: 15

ID: 2.8.1

$(8, 7)$ and $(20, 16)$
$x_1 \quad y_1 \quad x_2 \quad y_2$

$\text{distance} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$
$\text{distance} = \sqrt{((8) - (20))^2 + ((7) - (16))^2}$
$\text{distance} = \sqrt{(8 - 20)^2 + (7 - 16)^2}$
$\text{distance} = \sqrt{(-12)^2 + (-9)^2}$
$\text{distance} = \sqrt{144 + 81}$
$\text{distance} = \sqrt{225}$
$\text{distance} = 15$
Answer

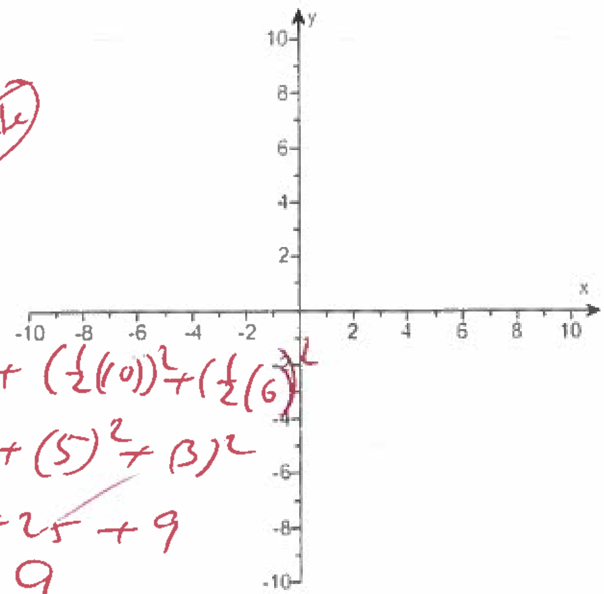
11. Complete the square and write the equation of the circle in standard form. Then determine the center and radius of the circle to graph the equation.

$x^2 + y^2 + 10x + 6y + 25 = 0$

$x^2 + 10x + y^2 + 6y = -25$ rewrite

The equation in standard form is ______.
(Simplify your answer.)

Use the graphing tool to graph the circle.



$x^2 + 10x + \left(\frac{1}{2}(10)\right)^2 + y^2 + 6y + \left(\frac{1}{2}(6)\right)^2 = -25 + \left(\frac{1}{2}(10)\right)^2 + \left(\frac{1}{2}(6)\right)^2$

$x^2 + 10x + (5)^2 + y^2 + 6y + (3)^2 = -25 + (5)^2 + (3)^2$

$x^2 + 10x + 25 + y^2 + 6y + 9 = -25 + 25 + 9$

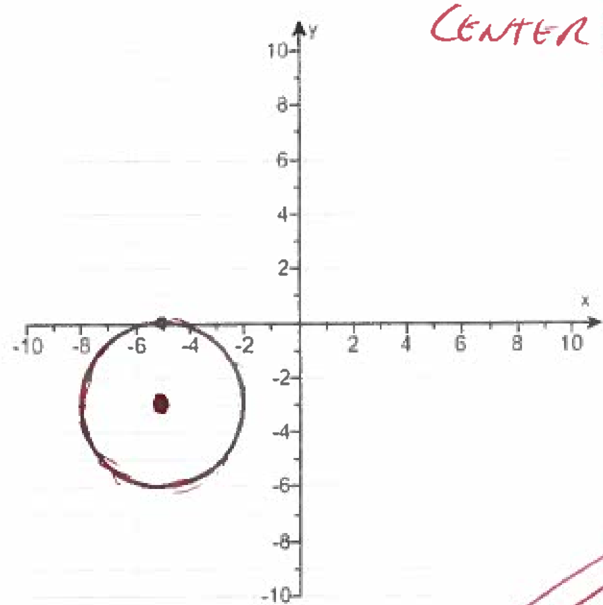
$(x+5)(x+5) + (y+3)(y+3) = 9$

$(x+5)^2 + (y+3)^2 = 9$

CENTER $= (-5, -3)$

Radius $= \sqrt{9} = 3$

Answers $(x + 5)^2 + (y + 3)^2 = 9$



CENTER $(-5, -3)$

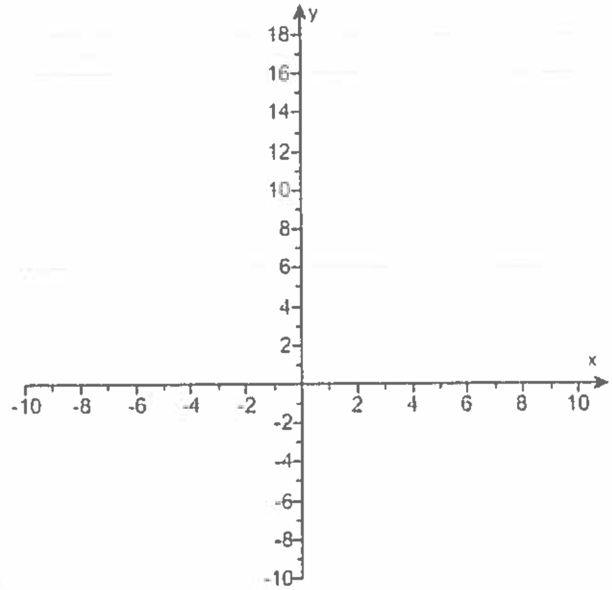
ANSWER

ID: 2.8.53

12.

Use the vertex and intercepts to sketch the graph of the quadratic function. Give the equation of the parabola's axis of symmetry. Use the graph to determine the domain and range of the function.

$f(x) = 4x - x^2 + 12$



Use the graphing tool to graph the equation. Use the vertex and one of the intercepts to draw the graph.

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

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

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

VERTEX max (2,16)

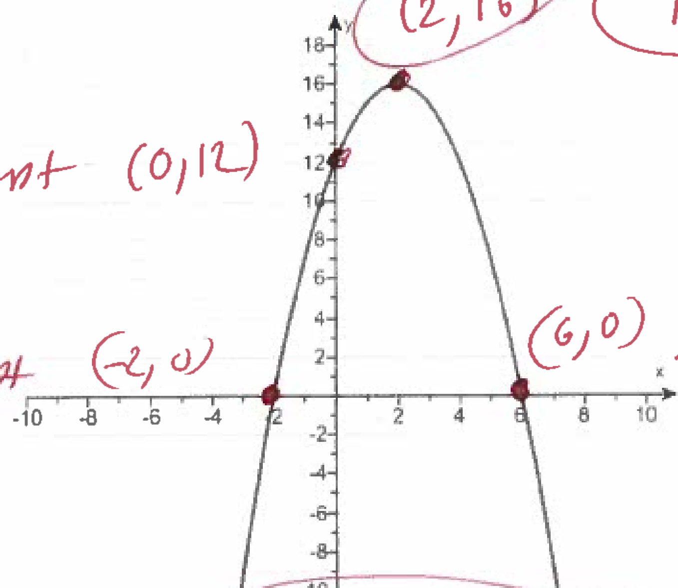
$y_1 = 4x - x^2 + 12$

Answers

y-intercept (0,12)

x-intercept (-2,0)

(6,0) x-intercept



ANSWER

$x = 2$

$(-\infty, \infty)$

$(-\infty, 16]$

use graphing Calculator
$y_1 = 4x - x^2 + 12$

| x | f(x) |
| --- | --- |
| -2 | 0 |
| 0 | 12 |
| 2 | 16 |
| 6 | 0 |

ID: 3.1.31

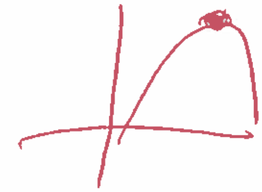
window
X-min = -12
X-max = 12
y-min = -10
y-max = 10

13. Consider the function $f(x) = -3x^2 + 12x - 8$.

a. Determine, without graphing, whether the function has a minimum value or a maximum value.
b. Find the minimum or maximum value and determine where it occurs.
c. Identify the function's domain and its range.

graph opens down

vertex max



a. The function has a (1) ____ value.

b. The minimum/maximum value is ____. It occurs at x = ____.

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

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

(1) ○ maximum
○ minimum

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

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

Answers (1) maximum

4

2

$(-\infty, \infty)$

$(-\infty, 4]$

ID: 3.1.41

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

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

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

$Vertex = (2, \ f(2))$

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

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

$Vertex = (2, \ -12 + 24 - 8)$

$= (2, 4)$

Vertex OR MAX

Answer

Primes, 2, 3, 5, 7, 11, 13, ...

14. The following function is given.

$f(x) = 3x^3 - 7x^2 - 75x + 175$

a. List all rational zeros that are possible according to the Rational Zero Theorem. Choose the correct answer below.

$$\begin{array}{r|l} 5 & 175 \\ 5 & 35 \\ 7 & 7 \\ & 1 \end{array}$$

$175 = 5 \cdot 5 \cdot 7$

A. $\pm 1, \pm 5, \pm 10, \pm 7, \pm 35, \pm 175, \pm \frac{1}{3}, \pm \frac{5}{3}, \pm \frac{10}{3}, \pm \frac{7}{3}, \pm \frac{35}{3}, \pm \frac{175}{3}$

B. $\pm 1, \pm 3, \pm \frac{1}{5}, \pm \frac{3}{5}, \pm \frac{1}{25}, \pm \frac{3}{25}, \pm \frac{1}{7}, \pm \frac{3}{7}, \pm \frac{1}{35}, \pm \frac{3}{35}, \pm \frac{1}{175}, \pm \frac{3}{175}$

C. $\pm 1, \pm 3, \pm \frac{1}{5}, \pm \frac{3}{5}, \pm \frac{1}{10}, \pm \frac{3}{10}, \pm \frac{1}{7}, \pm \frac{3}{7}, \pm \frac{1}{35}, \pm \frac{3}{35}, \pm \frac{1}{175}, \pm \frac{3}{175}$

D. $\pm 1, \pm 5, \pm 25, \pm 7, \pm 35, \pm 175, \pm \frac{1}{3}, \pm \frac{5}{3}, \pm \frac{25}{3}, \pm \frac{7}{3}, \pm \frac{35}{3}, \pm \frac{175}{3}$

b. Use synthetic division to test several possible rational zeros in order to identify one actual zero.

One rational zero of the given function is ______.
(Simplify your answer.)

Possible rational zeros

c. Use the zero from part (b) to find all the zeros of the polynomial function.

The zeros of the function $f(x) = 3x^3 - 7x^2 - 75x + 175$ are ______.
(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

$\frac{\text{Last}}{\text{first}} =$

Answers D. $\pm 1, \pm 5, \pm 25, \pm 7, \pm 35, \pm 175, \pm \frac{1}{3}, \pm \frac{5}{3}, \pm \frac{25}{3}, \pm \frac{7}{3}, \pm \frac{35}{3}, \pm \frac{175}{3}$

$\frac{\pm 175}{\pm 3} =$

$\frac{7}{3}$

$\frac{\pm 1, \pm 5, \pm 7, \pm 25, \pm 35, \pm 175}{\pm 3, \pm 1}$

$\frac{7}{3}, 5, -5$

$\pm 1, \pm 5, \pm 7, \pm 25, \pm 35, \pm 175, \pm \frac{1}{3}, \pm \frac{5}{3}, \pm \frac{7}{3}, \pm \frac{25}{3}, \pm \frac{35}{3}, \pm \frac{175}{3}$

ID: 3.4.11

Use synthetic division
Try $x = 5$

$$\begin{array}{r|rrrr} 5 & 3 & -7 & -75 & 175 \\ & & 15 & 40 & -175 \\ \hline & 3 & 8 & -35 & 0 \end{array}$$

0 rem

$3x^2 + 8x - 35 = 0$

$(3x - 7)(x + 5) = 0$

$3x - 7 = 0$ or $x + 5 = 0$

$3x - 7 + 7 = 0 + 7$ or $x + 5 - 5 = 0 - 5$

$3x = 7$ or $x = -5$

$\frac{3x}{3} = \frac{7}{3}$

$x = \frac{7}{3}$

answers

$\boxed{5, \frac{7}{3}, -5}$

15. Find the vertical asymptotes, if any, and the values of x corresponding to holes, if any, of the graph of the rational function.

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

set $x(x-1)=0$
$x=0$ OR $x-1=0$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice. (Type an equation. Use a comma to separate answers as needed.)

$x=0$ OR $x-1+1=0+1$

$x=1$

- A. The vertical asymptote(s) is(are) ______ and hole(s) corresponding to ______.
- B. The vertical asymptote(s) is(are) ______. There are no holes.
- C. There are no vertical asymptotes but there is(are) hole(s) corresponding to ______.
- D. There are no discontinuities.

answer

Answer: B. The vertical asymptote(s) is(are) **x = 1,x = 0**. There are no holes.

vertical asymptotes = $x=0$, $x=1$

ID: 3.5.23

16. Find the horizontal asymptote, if any, of the graph of the rational function.

$$g(x) = \frac{14x^2}{7x^2+6}$$

$$\lim_{x\to\infty}\left(\frac{14x^2}{7x^2+6}\right)\frac{\frac{1}{x^2}}{\frac{1}{x^2}} = \lim_{x\to\infty}\frac{\frac{14x^2}{x^2}}{\frac{7x^2}{x^2}+\frac{6}{x^2}} = \lim_{x\to\infty}\frac{14}{7+\frac{6}{x^2}} = \frac{14}{7+0} = \frac{14}{7} = 2 =$$

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

- A. The horizontal asymptote is ______. (Type an equation.)
- B. There is no horizontal asymptote.

Answer: A. The horizontal asymptote is **y = 2**. (Type an equation.)

formula $\lim_{x\to\infty}\frac{1}{x^n}=0$ horizontal asymptote $y=2$ answer

ID: 3.5.39

17. Use properties of logarithms to expand the logarithmic expression as much as possible. Evaluate logarithmic expressions without using a calculator if possible.

$$\ln\left[\frac{x^7\sqrt{x^2+3}}{(x+3)^5}\right]$$

$\ln\left(x^7\sqrt{x^2+3}\right) - \ln(x+3)^5 =$

$\ln(x^7) + \ln\sqrt{x^2+3} - \ln(x+3)^5 =$

$\ln(x^7) + \ln(x^2+3)^{\frac{1}{2}} - \ln(x+3)^5 =$

$$\ln\left[\frac{x^7\sqrt{x^2+3}}{(x+3)^5}\right] = \underline{\qquad}$$

$7\ln(x) + \frac{1}{2}\ln(x^2+3) - 5\ln(x+3) =$

answer

Answer: $7\ln x + \frac{1}{2}\ln\left(x^2+3\right) - 5\ln(x+3)$

formula
$\ln\left(\frac{A}{B}\right) = \ln(A) - \ln(B)$
$\ln(AB) = \ln(A) + \ln(B)$
$\ln(A^N) = N\ln(A)$

ID: 4.3.37

18. Solve the following exponential equation by expressing each side as a power of the same base and then equating exponents.

$25^{x+4} = 625^{x-4}$

$(5^2)^{x+4} = (5^4)^{x-4}$

$5^{2x+8} = 5^{4x-16}$

The solution set is { }.

$2x+8 = 4x-16$

Answer: 12

$2x+8-8 = 4x-16-8$

$2x = 4x-24$

ID: 4.4.19

$2x-4x = 4x-24-4x$

$-2x = -24$

$\frac{-2x}{-2} = \frac{-24}{-2}$

$x = 12$

answer

Check

19. Solve the logarithmic equation. Be sure to reject any value of x that is not in the domain of the original logarithmic expressions. Give the exact answer.

$\log_2(x-3) + \log_2(x+1) = 5$

$\log_2(x-3) + \log_2(x+1) = 5$

$\log_2(x-3)(x+1) = 5$

$2^5 = (x-3)(x+1)$ rewrite

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

$32 = x^2 + 1x - 3x - 3$

A. The solution set is { }.
(Simplify your answer. Use a comma to separate answers as needed.)

$32 = x^2 - 2x - 3$

B. There is no solution.

$0 = x^2 - 2x - 3 - 32$

$0 = x^2 - 2x - 35$

Answer: A. The solution set is { 7 }.
(Simplify your answer. Use a comma to separate answers as needed.)

$0 = (x+5)(x-7)$

$x+5=0$ or $x-7=0$

$x+5-5 = 0-5$ or $x-7+7 = 0+7$

ID: 4.4.69

$x = -5$ or $x = 7$

$\log_2(x-3) + \log_2(x+1) = 5$

$\log_2(-5-3) + \log_2(-5+1) = 5$

$\log_2(-8) + \log_2(-4) = 5$

BAD BAD

$\log_2(7-3) + \log_2(7+1) = 5$

$\log_2(4) + \log_2(8) = 5$

Good Good

Answer

$\boxed{x = 7}$

20. Solve the logarithmic equation. Be sure to reject any value of x that is not in the domain of the original logarithmic expressions. Give the exact answer.

$\log_4(x+7) - \log_4(x-8) = 2$

$\log_4\left(\frac{x+7}{x-8}\right) = 2$

$4^2 = \frac{x+7}{x-8}$

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

$\frac{16}{1} = \frac{x+7}{x-8}$

A. The solution set is { }.
(Simplify your answer. Use a comma to separate answers as needed.)

cross mult

B. There is no solution.

$16(x-8) = 1(x+7)$

$16x - 128 = 1x + 7$

Answer: A. The solution set is { 9 }.
(Simplify your answer. Use a comma to separate answers as needed.)

Check

$16x - 128 + 128 = 1x + 7 + 128$

ID: 4.4.71

$16x = 1x + 135$

$16x - 1x = 1x + 135 - 1x$

$15x = 135$

$\frac{15x}{15} = \frac{135}{15}$

$x = 9$

$\log_4(x+7) - \log_4(x-8) = 2$

$\log_4(9+7) - \log_4(9-8) = 2$

$\log_4(16) - \log_4(1) = 2$

Good Good

answer

$\boxed{x = 9}$

Formula $\ln(A^N) = N\ln(A)$ $\ln(e) = 1$

21. Complete the table for a savings account subject to continuous compounding.

($A = Pe^{rt}$) $19000 = 9500\, e^{.05t}$

| Amount Invested | Annual Interest Rate | Accumulated Amount | Time t in years |
|---|---|---|---|
| \$9500 | 5% | \$19,000 | ? |

Let A represent the accumulated amount, P the amount invested, r the annual interest rate, and t the time. Find the time, t.

t ≈ ____ years

(Round to one decimal place as needed.)

$\frac{19000}{9500} = \frac{9500\, e^{.05t}}{9500}$

$2 = e^{.05t}$

$\ln(2) = \ln(e^{.05t})$

$\ln(2) = .05t \ln(e)$

$\ln(2) = .05t(1)$

$\ln(2) = .05t$

$\frac{\ln(2)}{.05} = \frac{.05t}{.05}$

Answer: 13.9

$13.86294361 = t$ Answer

$13.9 = t$ Round

ID: 4.4.111

22. Solve the given system of equations. 2ND, Matrix, Edit, [A] 3x4

x + y + 5z = 1
x + y + 6z = 2
x + 8y + 6z = − 12

$[A] = \begin{bmatrix} 1 & 1 & 5 & 1 \\ 1 & 1 & 6 & 2 \\ 1 & 8 & 6 & -12 \end{bmatrix}$ Use graphing CALCULATOR

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

- A. There is one solution. The solution set is {( ____ , ____ , ____ )}. (Simplify your answers.) Go
- B. There are infinitely many solutions.
- C. There is no solution.

2ND, Matrix, Math, ↓, rref, rref([A]) = enter

Answer: A.

There is one solution. The solution set is {( −2 , −2 , 1 )}. (Simplify your answers.)

ID: 5.2.5

$\text{rref}([A]) = \begin{bmatrix} 1 & 0 & 0 & -2 \\ 0 & 1 & 0 & -2 \\ 0 & 0 & 1 & 1 \end{bmatrix} \begin{matrix} x \\ y \\ z \end{matrix}$

$(x, y, z) = (-2, -2, 1)$ Answer

23. Write the first four terms of the sequence whose general term is given.

$a_n = \frac{2n}{n+8}$

$a_1 =$ ☐ (Simplify your answer.)

$a_2 =$ ☐ (Simplify your answer.)

$a_3 =$ ☐ (Simplify your answer.)

$a_4 =$ ☐ (Simplify your answer.)

ANSWERS

$a_1 = \frac{2(1)}{1+8} = \frac{2}{9}$

Answers $\frac{2}{9}$

$\frac{2}{5}$

$\frac{6}{11}$

$\frac{2}{3}$

$a_2 = \frac{2(2)}{2+8} = \frac{4}{10} = \frac{\cancel{2}(2)}{\cancel{2}(5)} = \frac{2}{5}$

$a_3 = \frac{2(3)}{3+8} = \frac{6}{11}$

$a_4 = \frac{2(4)}{4+8} = \frac{8}{12} = \frac{\cancel{4}(2)}{\cancel{4}(3)} = \frac{2}{3}$

ID: 8.1.9

24. Find the indicated sum. $\sum_{k=1}^{5} k(k+2)$

$1(1+2) + 2(2+2) + 3(3+2) + 4(4+2) + 5(5+2) =$

$\sum_{k=1}^{5} k(k+2) =$ ☐ (Simplify your answer.)

$1(3) + 2(4) + 3(5) + 4(6) + 5(7) =$

$3 + 8 + 15 + 24 + 35 =$

OR

Answer: 85

use a graphing calculator

MATH, ↓ Go, Summation $\Sigma$

$85 =$

ID: 8.1.33

ANSWER

25. Use the binomial theorem to expand the binomial.

$(2x-3)^3$

${}_3C_0(2x)^3(-3)^0 + {}_3C_1(2x)^2(-3)^1 + {}_3C_2(2x)^1(-3)^2 + {}_3C_3(2x)^0(-3)^3$

$(2x-3)^3 =$ ☐ (Simplify your answer.)

Answer: $8x^3 - 36x^2 + 54x - 27$

$(1)(2^3x^3)(1) + (3)(2^2x^2)(-3) + (3)(2x)(9) + (1)(1)(-27) =$

ID: 8.5.13

$(1)(8x^3)(1) + (3)(4x^2)(-3) + (3)(2x)(9) + (1)(1)(-27) =$

$8x^3 - 36x^2 + 54x - 27 =$ ANSWER