02-21-19
02-22-19

Student: _____ **Instructor:** Alfredo Alvarez **Assignment:** 03-19-19 6K
Date: _____ **Course:** Math 1314 Alvarez MATH1314WARMUPCOREQM101

1. Perform the indicated operation.

$(-9x^3+6x^2-10x+4)+(2x^3+6x^2-2x-6)$

Write the polynomial in standard form.

$(-9x^3+6x^2-10x+4)+(2x^3+6x^2-2x-6)=$ [ ]

What is the degree of the polynomial?

[ ]

(Type a whole number.)

Answers $-7x^3+12x^2-12x-2$

3

$-9x^3+6x^2-10x+4+2x^3+6x^2-2x-6=$

$-7x^3+12x^2-12x-2=$

degree = 3

2. Perform the indicated operation.

$(8x^3-6x^2+9x-6)-(3x^3-9x^2-8x+8)$

Write the polynomial in standard form.

$(8x^3-6x^2+9x-6)-(3x^3-9x^2-8x+8)=$ [ ]

What is the degree of the polynomial?

[ ]

(Type a whole number.)

Answers $5x^3+3x^2+17x-14$

3

$8x^3-6x^2+9x-6-3x^3+9x^2+8x-8=$

$5x^3+3x^2+17x-14=$

degree = 3

3. Find the product.

$(x+5)(x^2-5x+25)$

$(x+5)(x^2-5x+25)=$ [ ] (Simplify your answer.)

Answer: x^3+125

$(x+5)(x^2-5x+25)=$

$x^3-5x^2+25x+5x^2-25x+125=$

$x^3+125=$

4. Find the product.

$(6x+5)(x^2+8x+2)$

$(6x+5)(x^2+8x+2)=$ [ ]
(Simplify your answer.)

Answer: $6x^3+53x^2+52x+10$

$(6x+5)(x^2+8x+2)$

$6x^3+48x^2+12x+5x^2+40x+10=$

$6x^3+53x^2+52x+10=$

5. Multiply.

$(x+9)(x+7)$

$(x+9)(x+7) =$ [ ] (Simplify your answer.)

Answer: $x^2+16x+63$

$(x+9)(x+7) =$
$x^2+7x+9x+63 =$
$x^2+16x+63 =$

6. Find the product.

$(x-6)(x+2)$

$(x-6)(x+2) =$ [ ]

Answer: $x^2-4x-12$

$(x-6)(x+2) =$
$x^2+2x-6x-12 =$
$x^2-4x-12 =$

7. Use the FOIL method to multiply the binomials.

$(6x+7)(4x+1)$

$(6x+7)(4x+1) =$ [ ] (Simplify your answer.)

Answer: $24x^2+34x+7$

$(6x+7)(4x+1) =$
$24x^2+6x+28x+7 =$
$24x^2+34x+7 =$

8. Find the product.

$(5x-7)(10x+7)$

$(5x-7)(10x+7) =$ [ ]

Answer: $50x^2-35x-49$

$(5x-7)(10x+7) =$
$50x^2+35x-70x-49 =$
$50x^2-35x-49 =$

9. Find the product.

$(x-3)(x+3)$

$(x-3)(x+3) =$ [ ] (Simplify your answer.)

Answer: x^2-9

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

10. Multiply using the rule for the product of the sum and difference of two terms.

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

$(2x+3)(2x-3) =$ [ ]

Answer: $4x^2-9$

$(2x+3)(2x-3) =$
$4x^2-6x+6x-9 =$
$4x^2-9 =$

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

$(x + 8)^2$

$(x + 8)^2 =$ [ ]

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

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

12. Find the product.

$(6x + 5)^2$

$(6x + 5)^2 =$ [ ] (Simplify your answer.)

Respuesta: $36x^2 + 60x + 25$

$(6x+5)^2 =$
$(6x+5)(6x+5) =$
$36x^2 + 30x + 30x + 25 =$
$36x^2 + 60x + 25 =$

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

$(x - 10)^2$

$(x - 10)^2 =$ [ ]

Answer: $x^2 - 20x + 100$

$(x-10)^2 =$
$(x-10)(x-10) =$
$x^2 - 10x - 10x + 100 =$
$x^2 - 20x + 100 =$

14. Use the FOIL method to multiply the binomials.

$(x - 5y)(2x + 5y)$

$(x - 5y)(2x + 5y) =$ [ ] (Simplify your answer.)

Answer: $2x^2 - 5xy - 25y^2$

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

15. Find the product.

$(8x + 5y)^2$

$(8x + 5y)^2 =$ [ ]

Respuesta: $64x^2 + 80xy + 25y^2$

$(8x+5y)^2 =$
$(8x+5y)(8x+5y) =$
$64x^2 + 40xy + 40xy + 25y^2 =$
$64x^2 + 80xy + 25y^2 =$

16. Find the product.

$(x-y)(x^2+xy+y^2)$

$(x-y)(x^2+xy+y^2) =$ ☐
(Simplify your answer.)

Answer: x^3-y^3

$(x-y)(x^2+xy+y^2) =$
$x^3+x^2y+xy^2-x^2y-xy^2-y^3 =$
$x^3-y^3 =$

17. Multiply using the rule for the product of the sum and difference of two terms.

$(6x+5y)(6x-5y)$

$(6x+5y)(6x-5y) =$ ☐

Answer: $36x^2-25y^2$

$(6x+5y)(6x-5y) =$
$36x^2-30xy+30xy-25y^2 =$
$36x^2-25y^2 =$

18. Factor the polynomial using the greatest common factor. If there is no common factor other than 1 and the polynomial cannot be factored, so state.

$18x+24$

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

- ○ A. $18x+24 =$ ☐
- ○ B. The polynomial is prime.

Answer: A. $18x+24 =$ **6(3x + 4)**

factor $18x+24 =$
$6(3x+4) =$

19. Factor the greatest common factor from the polynomial.

$28x^2+21x$

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

- ○ A. $28x^2+21x =$ ☐
- ○ B. The polynomial is prime.

Answer: A. $28x^2+21x =$ **7x(4x + 3)**

factor $28x^2+21x =$
$7x(4x+3) =$

20. Factor the given polynomial.

$x^2 + 7x + 10$

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

- A. $x^2 + 7x + 10 =$ _____
- B. The polynomial is prime.

Answer: A. $x^2 + 7x + 10 =$ **(x + 5)(x + 2)**

Poss. bk
10 . 1
2 . 5

$X^2+7X+10 =$
$(X+2)(X+5) =$

Check
$(X+2)(X+5) =$
$X^2+5X+2X+10 =$
$X^2+7X+10 =$
Good

21. Factor the trinomial, or state that the trinomial is prime.

$x^2 - 8x - 20$

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

- A. $x^2 - 8x - 20 =$ _____
- B. The polynomial is prime.

Answer: A. $x^2 - 8x - 20 =$ **(x − 10)(x + 2)**

Possible
20 . 1
10 . 2
4 . 5

$X^2-8X-20 =$
$(X+2)(X-10)$

Check
$(X+2)(X-10) =$
$X^2-10X+2X-20 =$
$X^2-8X-20 =$
Good

22. Factor the given polynomial.

$x^2 - 8x + 15$

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

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

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

Possible
15 . 1
5 . 3

$X^2-8X+15 =$
$(X-3)(X-5) =$

Check
$(X-3)(X-5) =$
$X^2-5X-3X+15 =$
$X^2-8X+15 =$
Good

23. Factor the trinomial completely.

$13x^2 - 25x - 2$

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

- A. $13x^2 - 25x - 2 =$ _____ (Factor completely.)
- B. The polynomial is prime.

Answer: A. $13x^2 - 25x - 2 =$ **(13x + 1)(x − 2)** (Factor completely.)

Possible
13 . 1
2 . 1

$13X^2-2+X-2 =$
$(13X+1)(X-2) =$

Check
$(13X+1)(X-2)$
$13X^2-26X+1X-2 =$
$13X^2-25X-2 =$
Good

24. Factor the trinomial, or state that the trinomial is prime.

$5a^2 - 4a - 28$

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

- A. $5a^2 - 4a - 28 =$ _____
- B. The polynomial is prime.

Answer: A. $5a^2 - 4a - 28 =$ **$(5a - 14)(a + 2)$**

$(5a-14)(a+2)$ check

$(5a-14)(a+2)$

$5a^2 + 10a - 14a - 28$

$5a^2 - 4a - 28$

25. Factor the difference of two squares.

$a^2 - b^2 = (a+b)(a-b)$ formula

$x^2 - 144$

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

- A. $x^2 - 144 =$ _____
- B. The polynomial is prime.

Answer: A. $x^2 - 144 =$ **$(x + 12)(x - 12)$**

$x^2 - 144 =$

$(x)^2 - (12)^2 =$

$(x+12)(x-12) =$

26. Factor the difference of two squares.

$a^2 - b^2 = (a+b)(a-b)$ formula

$16x^2 - 49$

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

- A. $16x^2 - 49 =$ _____
- B. The polynomial is prime.

Answer: A. $16x^2 - 49 =$ **$(4x + 7)(4x - 7)$**

$16x^2 - 49 =$

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

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

27. Factor the difference of two squares.

$a^2 - b^2 = (a+b)(a-b)$ formula

$64x^2 - 121y^2$

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

- A. $64x^2 - 121y^2 =$ _____
- B. The polynomial is prime.

Answer: A. $64x^2 - 121y^2 =$ **$(8x + 11y)(8x - 11y)$**

$64x^2 - 121y^2 =$

$(8x)^2 - (11y)^2 =$

$(8x+11y)(8x-11y) =$

28. Factor the perfect square.

$x^2 - 18x + 81$

Possible
81. 1
27. 3
9. 9

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

- A. $x^2 - 18x + 81 =$ _____
- B. The polynomial is prime.

$x^2 - 18x + 81$
$(x-9)(x-9) =$

Check
$(x-9)(x-9) =$
$x^2 - 9x - 9x + 81 =$
$x^2 - 18x + 81 =$
Good

Answer: A. $x^2 - 18x + 81 =$ $(x-9)^2$

29. Factor the perfect square.

$4x^2 - 4x + 1$

Possible
4. 1
2. 2
1. 1

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

- A. $4x^2 - 4x + 1 =$ _____
- B. The polynomial is prime.

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

Check
$(2x-1)(2x-1) =$
$4x^2 - 2x - 2x + 1 =$
$4x^2 - 4x + 1 =$
Good

Answer: A. $4x^2 - 4x + 1 =$ $(2x-1)^2$

30. Factor the expression completely or state that the polynomial is prime.

$7x^3 - 7x$

formula $a^2 - b^2 = (a+b)(a-b)$

$7x^3 - 7x =$
$7x(x^2 - 1) =$
$7x((x)^2 - (1)^2) =$
$7x(x+1)(x-1) =$

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

- A. $7x^3 - 7x =$ _____ (Factor completely.)
- B. The polynomial is prime.

Answer: A. $7x^3 - 7x =$ $7x(x+1)(x-1)$ (Factor completely.)

31. Factor the trinomial completely.

$3x^2 + 18x + 15$

$3x^2 + 18x + 15 =$
$3(x^2 + 6x + 5) =$
$3(x+1)(x+5) =$

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

- A. $3x^2 + 18x + 15 =$ _____ (Factor completely.)
- B. The polynomial is prime.

Answer: A. $3x^2 + 18x + 15 =$ $3(x+1)(x+5)$ (Factor completely.)

32. Factor the expression completely or state that the polynomial is prime.

$3x^2 - 3x - 126$

$3x^2-3x-126 =$
$3(x^2-x-42) =$
$3(x+6)(x-7) =$

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

- A. $3x^2 - 3x - 126 =$ _____ (Factor completely.)
- B. The polynomial is prime.

Answer: A. $3x^2 - 3x - 126 =$ **$3(x+6)(x-7)$** (Factor completely.)

33. Factor completely, or state that the polynomial is prime.

$2x^3 - 32x$

formula
$a^2-b^2=(a+b)(a-b)$

$2x^3-32x$
$2x(x^2-16) =$
$2x(x)^2-(4)^2) =$
$2x(x+4)(x-4) =$

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

- A. $2x^3 - 32x =$ _____
- B. The polynomial is prime.

Answer: A. $2x^3 - 32x =$ **$2x(x+4)(x-4)$**

34.

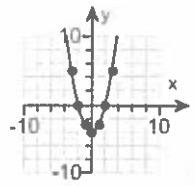
Find seven ordered pairs to the equation $y = x^2 - 4$. Then determine its graph.

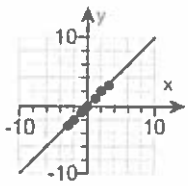
x	y
−3	5
−2	0
−1	−3
0	−4
1	−3
2	0
3	5

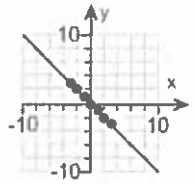
Points
(−3, 5)
(−2, 0)
(−1, −3)
(0, −4)
(1, −3)
(2, 0)
(3, 5)

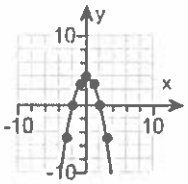
$y = x^2 - 4$

Choose the graph that connects the points.

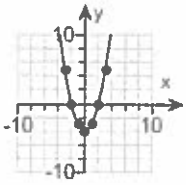
A. 

B. 

C. 

D. 

Answers 5
0
−3
−4
−3
0
5



A.

$y = (-3)^2 - 4 = (-3)(-3) - 4 = 9 - 4 = 5$

$y = (-2)^2 - 4 = (-2)(-2) - 4 = 4 - 4 = 0$

$y = (-1)^2 - 4 = (-1)(-1) - 4 = 1 - 4 = -3$

$y = (0)^2 - 4 = (0)(0) - 4 = 0 - 4 = -4$

$y = (1)^2 - 4 = (1)(1) - 4 = 1 - 4 = -3$

$y = (2)^2 - 4 = (2)(2) - 4 = 4 - 4 = 0$

$y = (3)^2 - 4 = (3)(3) - 4 = 9 - 4 = 5$

35. Graph the equation $y = x + 2$. Let $x = -3, -2, -1, 0, 1, 2,$ and 3.

Find the following y-values. Then choose the correct graph of the equation to the right.

x	y
−3	−1
−2	0
−1	1
0	2
1	3
2	4
3	5

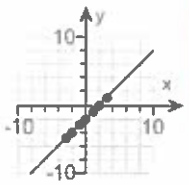
Points
(−3, −1)
(−2, 0)
(−1, 1)
(0, 2)
(1, 3)
(2, 4)
(3, 5)

$y = x + 2$

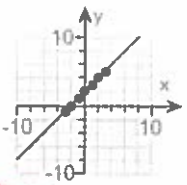
Answers −1
0
1
2
3
4
5

$y = (-3) + 2 = -3 + 2 = -1$
$y = (-2) + 2 = -2 + 2 = 0$
$y = (-1) + 2 = -1 + 2 = 1$
$y = (0) + 2 = 0 + 2 = 2$
$y = (1) + 2 = 1 + 2 = 3$
$y = (2) + 2 = 2 + 2 = 4$
$y = (3) + 2 = 3 + 2 = 5$

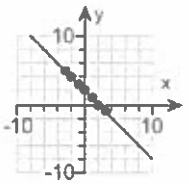
A.



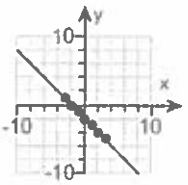
B.

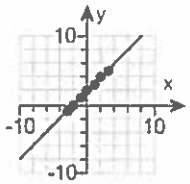


C.



D.





B.

36.

Graph the equation. Let x = − 3, − 2, − 1, 0, 1, 2, and 3.

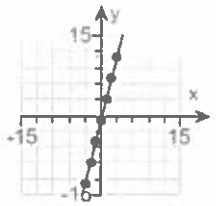
$y = 4x + 1$

x	y
− 3	−11
− 2	−7
− 1	−3
0	1
1	5
2	9
3	13

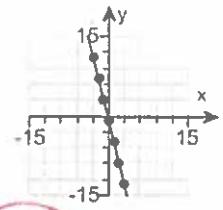
Points
(−3, −11)
(−2, −7)
(−1, −3)
(0, 1)
(1, 5)
(2, 9)
(3, 13)

Choose the graph on the right that connects the points.

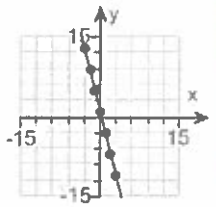
○ A.



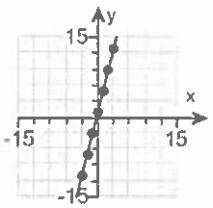
○ B.



○ C.



● D.



$y = 4x + 1$

$y = 4(-3) + 1 = -12 + 1 = -11$

$y = 4(-2) + 1 = -8 + 1 = -7$

$y = 4(-1) + 1 = -4 + 1 = -3$

$y = 4(0) + 1 = 0 + 1 = 1$

$y = 4(1) + 1 = 4 + 1 = 5$

$y = 4(2) + 1 = 8 + 1 = 9$

$y = 4(3) + 1 = 12 + 1 = 13$

Answers − 11

− 7

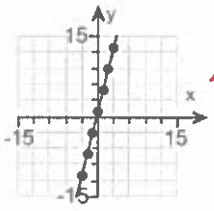
− 3

1

5

9

13



D.

37.

Find seven ordered pairs to the equation $y = 5 - x^2$. Then determine its graph.

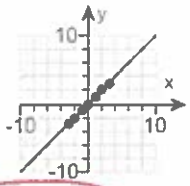
x	y
−3	−4
−2	1
−1	4
0	5
1	4
2	1
3	−4

Points
(−3, −4)
(−2, 1)
(−1, 4)
(0, 5)
(1, 4)
(2, 1)
(3, −4)

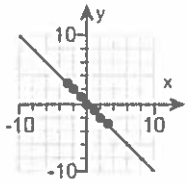
$y = 5 - x^2$

Choose the graph that connects the points.

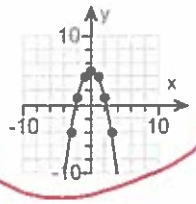
A.



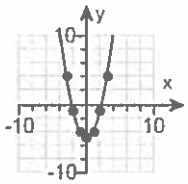
B.



C.



D.



Answers −4

1

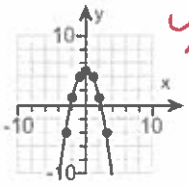
4

5

4

1

−4



C.

$y = 5 - (-3)^2 = 5 - (-3)(-3) = 5 - (9) = 5 - 9 = -4$

$y = 5 - (-2)^2 = 5 - (-2)(-2) = 5 - (4) = 5 - 4 = -1$

$y = 5 - (-1)^2 = 5 - (-1)(-1) = 5 - (1) = 5 - 1 = 4$

$y = 5 - (0)^2 = 5 - (0)(0) = 5 - (0) = 5 - 0 = 5$

$y = 5 - (1)^2 = 5 - (1)(1) = 5 - (1) = 5 - 1 = 4$

$y = 5 - (2)^2 = 5 - (2)(2) = 5 - (4) = 5 - 4 = 1$

$y = 5 - (3)^2 = 5 - (3)(3) = 5 - (9) = 5 - 9 = -4$

38. Graph the equation. Let x = −3, −2, −1, 0, 1, 2, or 3.

$y = -9$

Find the following y-values. Then choose the correct graph of the equation to the right.

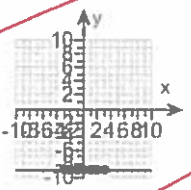
x	y
−3	−9
−2	−9
−1	−9
0	−9
1	−9
2	−9
3	−9

always

$y = -9$

Answers −9
−9
−9
−9
−9
−9
−9

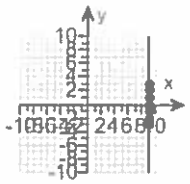
D.

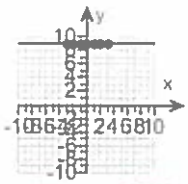


x	y
−3	−9
−2	−9
−1	−9
0	−9
1	−9
2	−9
3	−9

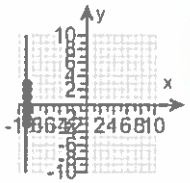
Points
(−3, −9)
(−2, −9)
(−1, −9)
(0, −9)
(1, −9)
(2, −9)
(3, −9

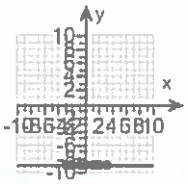
A. B.





C. D.





(0, −9) (1, −9)

39. Use factoring to solve the quadratic equation. Check by substitution or by using a graphing utility and identifying x-intercepts.

$x^2 - x - 56 = 0$

$x^2 - x - 56 = 0$
$(x+7)(x-8) = 0$

The solution set is { }.
(Use a comma to separate answers as needed. Type repeated roots only once.)

$x+7=0$ OR $x-8=0$

Answer: −7,8

$x+7-7=0-7$ OR $x-8+8=0+8$

$x=-7$ OR $x=8$

40. Solve the equation by factoring.

$x^2 = 7x + 30$

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

Answer: 10, − 3

$x^2 = 7x + 30$
$x^2 - 7x - 30 = 0$
$(x+3)(x-10) = 0$
Set $x+3=0$ or $x-10=0$
$x+3-3=0-3$ OR $x-10+10=0+10$
$x=-3$ OR $x=10$

41. Solve the equation by factoring.

$9x^2 + 21x - 8 = 0$

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

Answer: $\frac{1}{3}, -\frac{8}{3}$

$9x^2 + 21x - 8 = 0$
$(3x-1)(3x+8) = 0$
Set $3x-1=0$ OR $3x+8=0$
$3x-1+1=0+1$ OR $3x+8-8=0-8$
$3x=1$ $3x=-8$
$\frac{3x}{3} = \frac{1}{3}$ $x = \frac{1}{3}$ $\frac{3x}{3} = \frac{-8}{3}$ $x = \frac{-8}{3}$

42. Use factoring to solve the quadratic equation. Check by substitution or by using a graphing utility and identifying x-intercepts.

$5x^2 + 10x = 0$

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

Answer: 0, − 2

$5x^2 + 10x = 0$
$5x(x+2) = 0$
Set $5x=0$ OR $x+2=0$
$\frac{5x}{5} = \frac{0}{5}$ OR $x+2-2=0-2$
$x=0$ OR $x=-2$

43. Solve the equation by the square root property.

$(x-7)^2 = 16$

What is the solution set?

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

Answer: 3, 11

$(x-7)^2 = 16$
$\sqrt{(x-7)^2} = \pm\sqrt{16}$
$x-7 = \pm 4$
$x-7=-4$ or $x-7=4$
$x-7+7=-4+7$ OR $x-7+7=4+7$
$x=3$ or $x=11$

44. Solve the quadratic equation by completing the square.

$x^2 + 4x = 12$

What is the solution set?

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

Answer: 2, − 6

$x^2+4x=12$
$x^2+4x+\left(\frac{1}{2}(4)\right)^2 = 12+\left(\frac{1}{2}(4)\right)^2$
$x^2+4x+(2)^2 = 12+(2)^2$
$x^2+4x+4 = 12+4$
$x^2+4x+4 = 16$
$(x+2)(x+2) = 16$
$(x+2)^2 = 16$
$\sqrt{(x+2)^2} = \pm\sqrt{16}$
$x+2 = \pm 4$
$x+2=-4$ OR $x+2=4$
$x+2-2=-4-2$ $x+2-2=4-2$
$x=-6$ OR $x=2$

(45) $x^2 - 3x = 18$

$x^2 - 3x + \left(\frac{1}{2}(-3)\right) = 18 + \left(\frac{1}{2}(-3)\right)^2$

$x^2 - 3x + \left(\frac{-3}{2}\right)^2 = 18 + \left(\frac{-3}{2}\right)^2$

$x^2 - 3x + \left(\frac{-3}{2}\right)\left(\frac{-3}{2}\right) = 18 + \left(\frac{-3}{2}\right)\left(\frac{-3}{2}\right)$

$x^2 - 3x + \frac{9}{4} = 18 + \frac{9}{4}$

$\left(x - \frac{3}{2}\right)\left(x - \frac{3}{2}\right) = 18 + \frac{9}{4}$

$\left(x - \frac{3}{2}\right)^2 = \frac{18}{1}\left(\frac{4}{4}\right) + \frac{9}{4}$

$\left(x - \frac{3}{2}\right)^2 = \frac{72}{4} + \frac{9}{4}$

$\left(x - \frac{3}{2}\right)^2 = \frac{72+9}{4}$

$\left(x - \frac{3}{2}\right)^2 = \frac{81}{4}$

$\sqrt{\left(x - \frac{3}{2}\right)^2} = \pm\sqrt{\frac{81}{4}}$

$x - \frac{3}{2} = \pm\frac{9}{2}$

$x = \frac{3}{2} + \frac{9}{2}$

$x = \frac{3+9}{2}$ or $x = \frac{3-9}{2}$

$x = \frac{12}{2}$ or $x = \frac{-6}{2}$

$x = 6$ or $x = -3$

(46) $1x^2 + 10x + 24 = 0$

$a = 1,\ b = 10,\ c = 24$

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

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{100 - 96}}{2}$$

$$x = \frac{-10 \pm \sqrt{4}}{2}$$

$$x = \frac{-10 \pm 2}{2}$$

$$x = -5 \pm 1$$

$x = -5 + 1$ OR $x = -5 - 1$

$x = -4$ OR $x = -6$

(47) $3x^2 - 4x = 4$

$3x^2 - 4x - 4 = 0$

$a = 3,\ b = -4,\ c = -4$

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

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(3)(-4)}}{2(3)}$$

$$x = \frac{4 \pm \sqrt{16 + 48}}{6}$$

$$x = \frac{4 \pm \sqrt{64}}{6}$$

$$x = \frac{4 \pm 8}{6}$$

$x = \frac{4+8}{6}$ or $x = \frac{4-8}{6}$

$x = \frac{12}{6}$ or $x = -\frac{4}{6}$

$x = 2$ or $x = \frac{2(-2)}{2(3)}$

or $x = -\frac{2}{3}$

(8) $x^2+4x=11$

$1x^2+4x-11=0$

$a=1,\ b=4,\ c=-11$

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

$$x=\frac{-(4)\pm\sqrt{(4)^2-4(1)(-11)}}{2(1)}$$

$$x=\frac{-4\pm\sqrt{16+44}}{2}$$

$$x=\frac{-4\pm\sqrt{60}}{2}$$

$$x=\frac{-4\pm\sqrt{4\cdot 15}}{2}$$

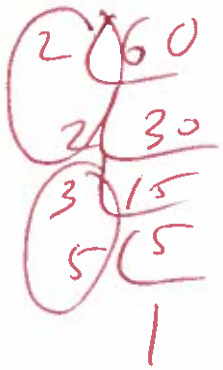
$$x=\frac{-4\pm\sqrt{4}\sqrt{15}}{2}$$

$$x=\frac{-4\pm 2\sqrt{15}}{2}$$

$$x=-2\pm\sqrt{15}$$

$x=-2+\sqrt{15}$ or $x=-2-\sqrt{15}$

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



(49) $3x^2 - 24x + 48 = 0$

$3(x^2 - 8x + 16) = 0$

$3(x-4)(x-4) = 0$

Let $3 = 0$ OR $x-4=0$ OR $x-4=0$

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

$x=4$ OR $x=4$

Answer $\{4\}$

51. $1y^2 - 10y + 41 = 0$

$a = 1, \quad b = -10, \quad c = 41$

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

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(41)}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{100 - 164}}{2}$$

$$x = \frac{10 \pm \sqrt{-64}}{2}$$

$$x = \frac{10 \pm 8i}{2}$$

$$x = 5 \pm 4i$$

$x = 5 + 4i$ OR $x = 5 - 4i$

(52.) $3x^2 - 8x = 0$

$x(3x - 8) = 0$

$x = 0$ or $3x - 8 = 0$

$3x - 8 + 8 = 0 + 8$

$3x = 8$

$\frac{3x}{3} = \frac{8}{3}$

$x = \frac{8}{3}$

(53) $y = x^2 + 2x - 3$

Let $x^2 + 2x - 3 = 0$

$(x-1)(x+3) = 0$

Let $x - 1 = 0$ or $x + 3 = 0$

$x - 1 + 1 = 0 + 1$ or $x + 3 - 3 = 0 - 3$

$x = 1$ or $x = -3$

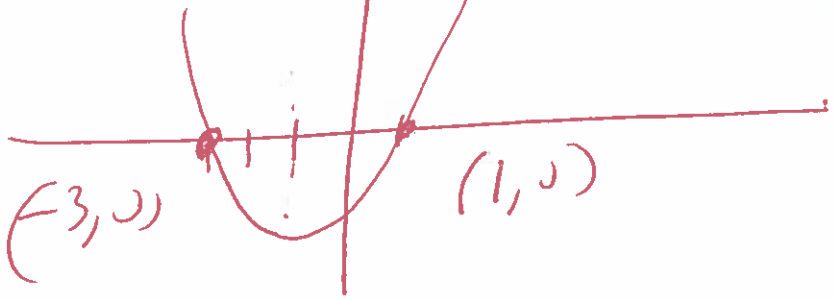
x-intercepts $x = 1$ or $x = -3$

or $(1, 0)$ or $(-3, 0)$ Points

use graphing calculator

$y_1 = x^2 + 2x - 3$

Xmin -12
Xmax 12
Xscl $= 1$
Ymin $= -10$
Ymax $= 10$
Yscl $= 1$



(54) $\sqrt{2x+22} = x+7$

$(\sqrt{2x+22})^2 = (x+7)^2$

$2x+22 = (x+7)(x+7)$

$2x+22 = x^2+7x+7x+49$

$2x+22 = x^2+14x+49$

$0 = x^2+14x+49-2x-22$

$0 = x^2+12x+27$

$0 = (x+3)(x+9)$

so $x+3=0$ or $x+9=0$

$x+3-3=0-3$ or $x+9-9=0-9$

$x=-3$ or $x=-9$

Check

$\sqrt{2x+22} = x+7$

$\sqrt{2(-3)+22} = (-3)+7$

$\sqrt{-6+22} = -3+7$

$\sqrt{16} = 4$

$4 = 4$

GOOD

$\sqrt{2(-9)+22} = (-9)+7$

$\sqrt{-18+22} = -9+7$

$\sqrt{4} = -2$

$2 \neq -2$

BAD

Poss. 64
27.1
9.3

answer
$\{-3\}$

55

$f(x) = x$

$g(x) = x - 3$

Graph

use

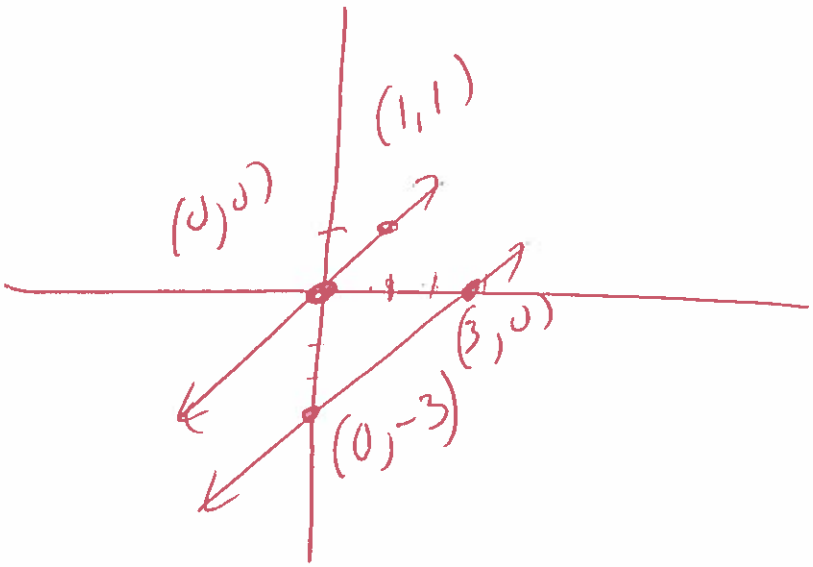
graphing

Calculator

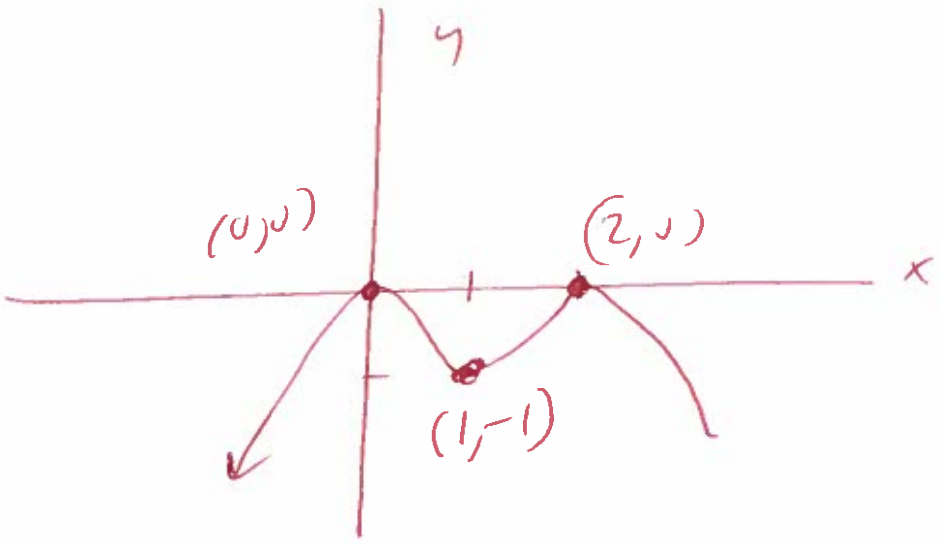
$y_1 = x$

$y_2 = x - 3$

Parallel Lines



56



the function is increasing on the intervals
$(-\infty, 0)$ and $(1, 2)$

the function is decreasing on the intervals
$(0, 1)$ and $(2, \infty)$

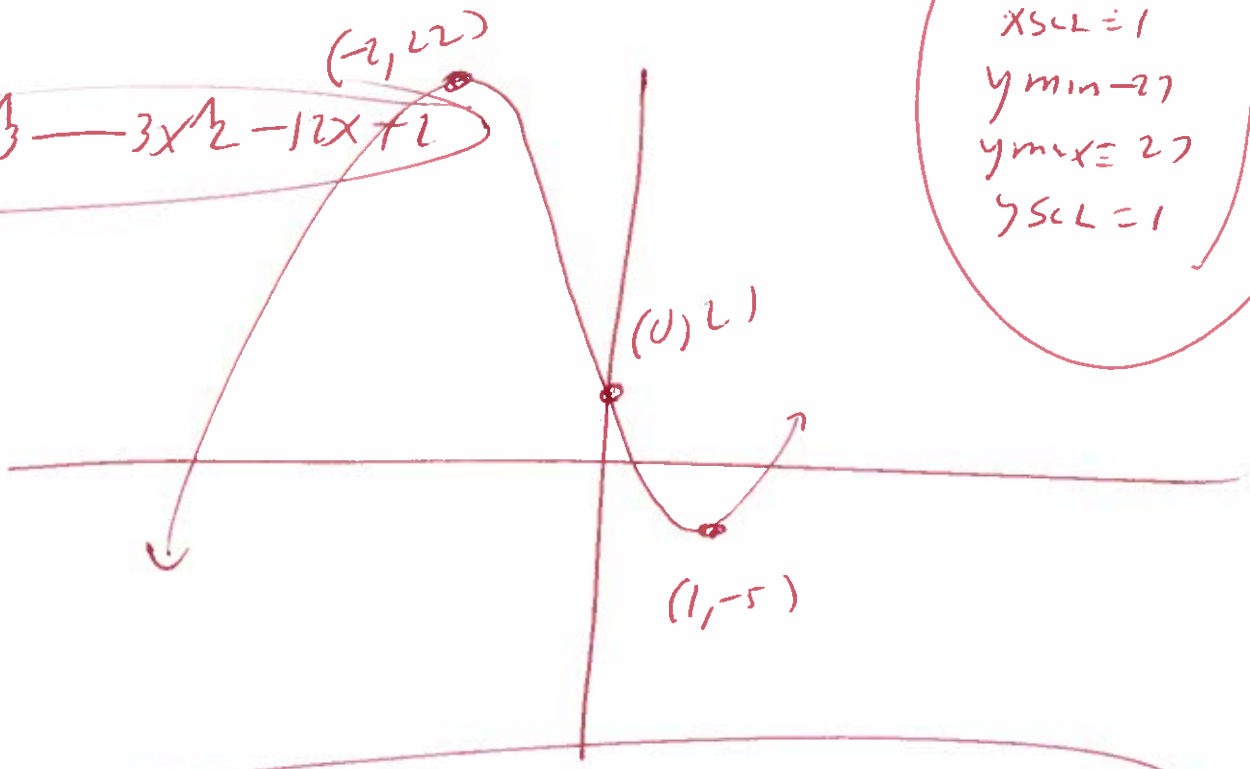
The function is never Constant

57

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

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

Xmin = -5
Xmax = 5
Xscl = 1
Ymin = -27
Ymax = 27
Yscl = 1



The function has a relative maximum at $x = -2$ $(-2, 22)$

The function has a relative minimum at $x = 1$ $(1, -5)$

58

$$f(x) = \begin{cases} x+5 & \text{if } x < -4 \\ x-5 & \text{if } x \geq -4 \end{cases}$$

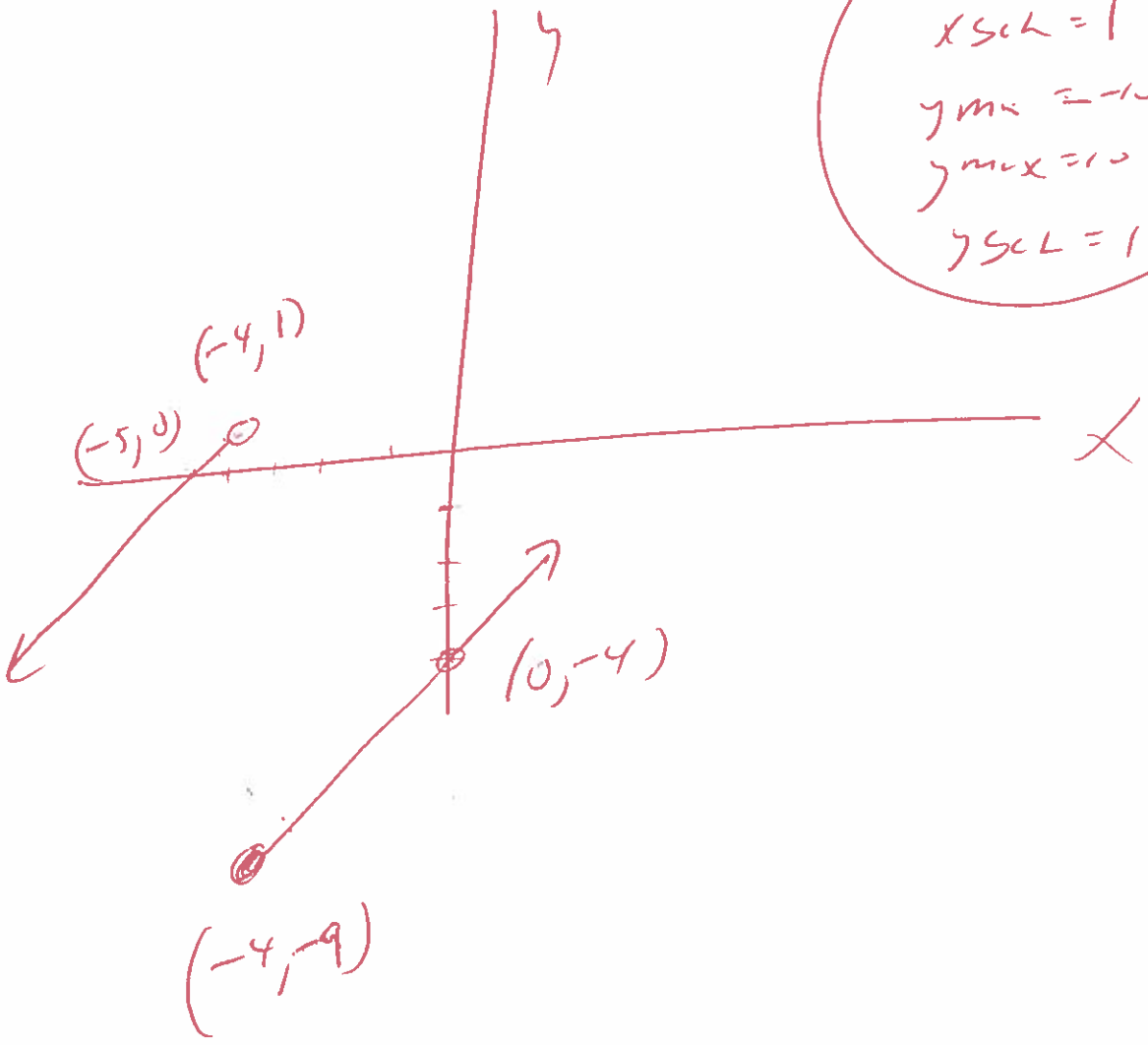
2nd) math

$y_1 = x+5 \div (x < -4)$ ∅ Ptea

2nd math

$y_2 = x-5 \div (x \geq -4)$ Close

Xmin = -12
Xmax = 12
Xscl = 1
ymin = -10
ymax = 10
yscl = 1



(55) $f(x) = x^2 - 5x + 7$

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

$$\frac{((x+h)^2 - 5(x+h) + 7) - (x^2 - 5x + 7)}{h} =$$

$$\frac{(x+h)(x+h) - 5x - 5h + 7 - x^2 + 5x - 7}{h} =$$

$$\frac{x^2 + xh + xh + h^2 - 5x - 5h + 7 - x^2 + 5x - 7}{h} =$$

$$\frac{x^2 + 2xh + h^2 - 5x - 5h + 7 - x^2 + 5x - 7}{h} =$$

$$\frac{2xh + h^2 - 5h}{h} =$$

$$2x + h - 5 =$$

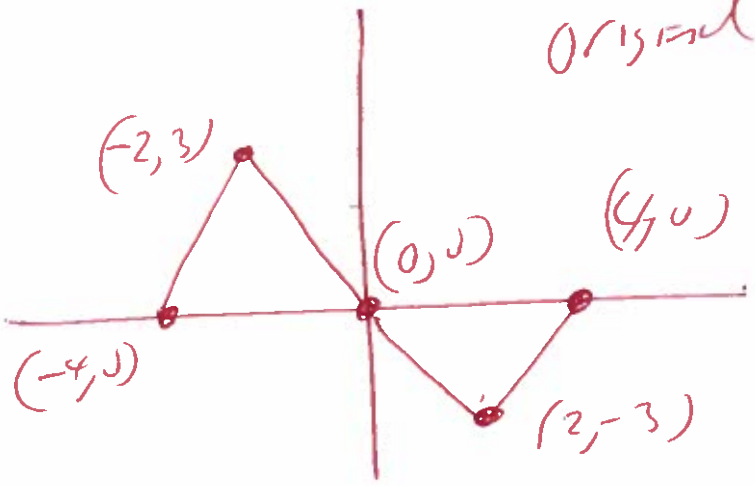
(60) $y = f(x)$

find $g(x) = f(x+1)+3$

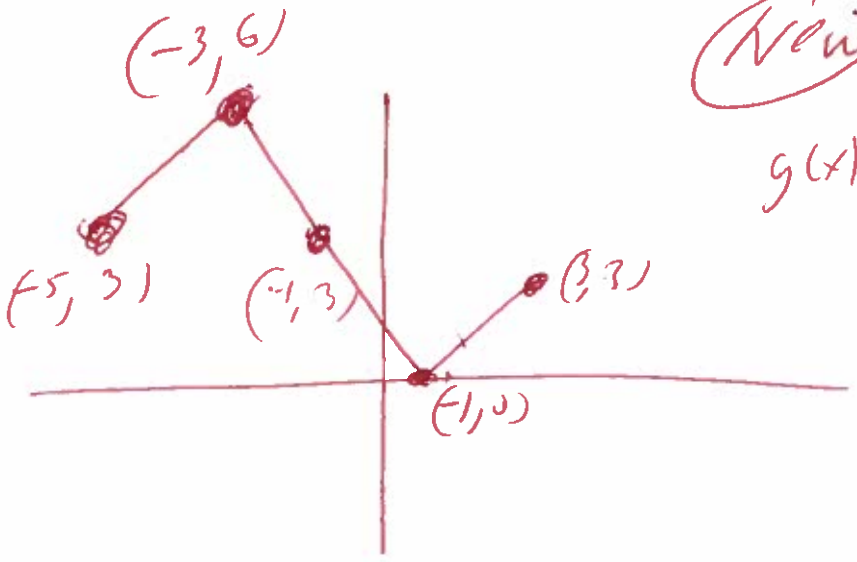
move left −1

move up +3

Original $y = f(x)$



New $g(x) = f(x+1)+3$



(61) Find domain

$f(x) = \sqrt{45 - 5x}$

formula

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

set $Ax + B \geq 0$

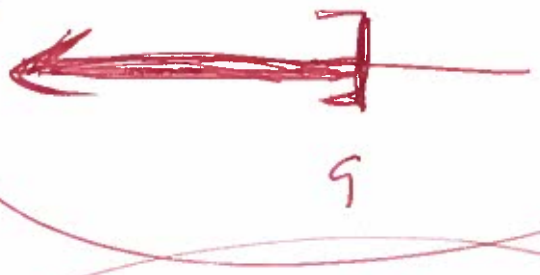
so $45 - 5x \geq 0$

$45 - 5x - 45 \geq 0 - 45$

$-5x \geq -45$

$\frac{-5x}{-5} \leq \frac{-45}{-5}$

$x \leq 9$



9

$(-\infty, 9]$

(62) $f(x) = 4x^2 - 38x + 18 \quad g(x) = x - 9$

$(f+g)(x) =$

$f(x) + g(x) =$

$(4x^2 - 38x + 18) + (x - 9) =$

$4x^2 - 38x + 18 + x - 9 =$

$4x^2 - 37x + 9 =$

dom $(-\infty, \infty)$

$(f-g)(x) =$

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

$(4x^2 - 38x + 18) - (x - 9) =$

$4x^2 - 38x + 18 - x + 9 =$

$4x^2 - 39x + 27 =$

dom $(-\infty, \infty)$

$(f \cdot g)(x) =$

$f(x) \cdot g(x) =$

$(4x^2 - 38x + 18)(x - 9) =$

$4x^3 - 36x^2 - 38x^2 + 342x + 18x - 162 =$

$4x^3 - 74x^2 + 360x - 162$

dom $(-\infty, \infty)$

$\frac{f}{g}(x) =$

$\frac{f(x)}{g(x)} =$

$\frac{4x^2 - 38x + 18}{x - 9} =$

$\frac{2(2x^2 - 19x + 9)}{x - 9} =$

$\frac{2(2x-1)(x-9)}{(x-9)} =$

$2(2x-1) =$

$4x - 2 =$

dom $(-\infty, 9) \cup (9, \infty)$

(63) $f(x) = 1 - x$ and $g(x) = 2x^2 + x + 2$

$(f \circ g)(x) =$

$f(g(x)) =$

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

$1 - (2x^2 + x + 2) =$

$1 - 2x^2 - x - 2 =$

$-2x^2 - x - 1$

$(f \circ g)(x) = -2x^2 - x - 1$

$(f \circ g)(2) = -2(2)^2 - (2) - 1$

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

$(f \circ g)(2) = -8 - 2 - 1$

$(f \circ g)(2) = -11$ ✓

$(g \circ f)(x) =$

$g(f(x)) =$

$g(1 - x) =$

$2(1-x)^2 + (1-x) + 2 =$

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

$2(1 - 1x - 1x + x^2) + (1-x) + 2 =$

$2(1 - 2x + x^2) + (1-x) + 2 =$

$2 - 4x + 2x^2 + 1 - x + 2 =$

$2x^2 - 5x + 5 =$ ✓

$(g \circ f)(x) = 2x^2 - 5x + 5$

$(g \circ f)(2) = 2(2)^2 - 5(2) + 5$

$(g \circ f)(2) = 2(2)(2) - 5(2) + 5$

$(g \circ f)(2) = 2(4) - 5(2) + 5$

$(g \circ f)(2) = 8 - 10 + 5$

$(g \circ f)(2) = -2 + 5$

$(g \circ f)(2) = 3$ ✓

(64) find distance

(1, 1) and (5, 4)

$x_1\ y_1 \qquad x_2\ y_2$

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

$$d = \sqrt{((1) - (5))^2 + ((1) - (4))^2}$$

$$d = \sqrt{(1-5)^2 + (1-4)^2}$$

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

$$d = \sqrt{16 + 9}$$

$$d = \sqrt{25}$$

$$\boxed{d = 5}$$

(65) (4, 6) and (2, 10)

x_1 y_1 x_2 y_2

$$\text{Midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$\text{Mid point} = \left(\frac{(4) + (2)}{2}, \frac{(6) + (10)}{2} \right)$$

$$\text{Mid point} = \left(\frac{4+2}{2}, \frac{6+10}{2} \right)$$

$$\text{Mid point} = \left(\frac{6}{2}, \frac{16}{2} \right)$$

$$\text{Mid point} = (3, 8)$$

(66)

$x^2+y^2+6x+2y+1=0$

$x^2+6x+y^2+2y=-1$

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

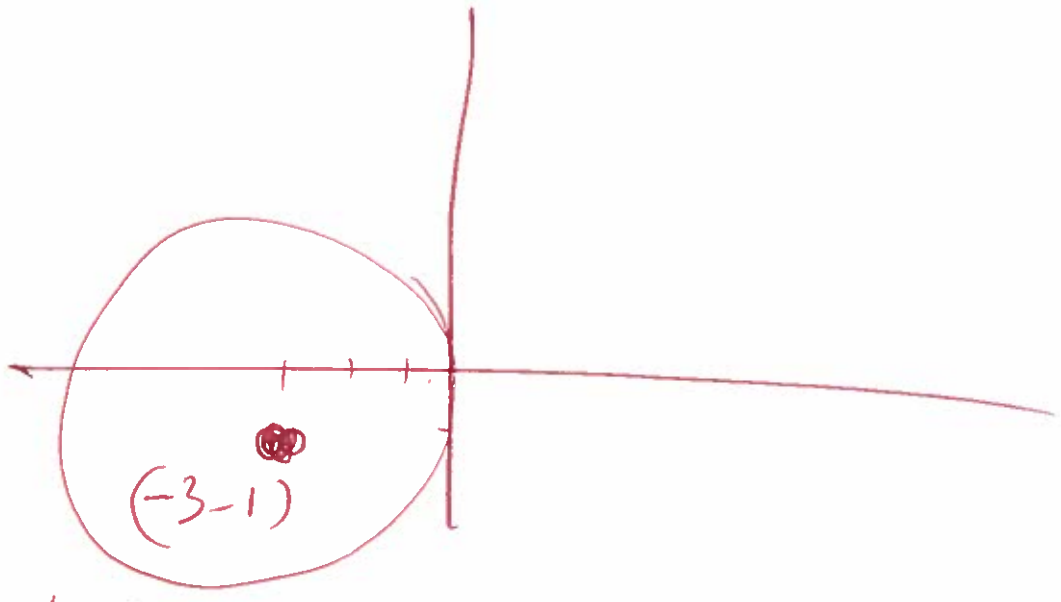
$x^2+6x+(3)^2+y^2+2y+(1)^2=-1+(3)^2+(1)^2$

$x^2+6x+9+y^2+2y+1=-1+9+1$

$(x+3)(x+3)+(y+1)(y+1)=9$

$(x+3)^2+(y+1)^2=9$

Centre $=(-3,-1)$ Radius $=\sqrt{9}=3$



Center

Find Vertex

(67) $f(x) = 2x^2 - 16x + 6$

$a = 2,\ b = -16,\ c = 6$

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

$Vertex = \left(-\frac{-(-16)}{2(2)},\ f\left(\frac{(-16)}{2(2)}\right)\right)$

$Vertex = \left(\frac{16}{4},\ f\left(\frac{16}{4}\right)\right)$

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

$Vertex = (4,\ 2(4)^2 - 16(4) + 6)$

$Vertex = (4,\ 2(4)(4) - 16(4) + 6)$

$Vertex = (4,\ 2(16) - 16(4) + 6)$

$Vertex = (4,\ 32 - 64 + 6)$

$Vertex = (4,\ -32 + 6)$

$Vertex = (4, -26)$

Find Vertex

(68) $f(x) = -x^2 + 4x + 8$

$a = -1, \quad b = 4, \quad c = 8$

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

$Vertex = \left(\frac{-(4)}{2(-1)}, \; f\left(\frac{+(4)}{2(-1)}\right)\right)$

$Vertex = \left(\frac{-4}{-2}, \; f\left(\frac{4}{-2}\right)\right)$

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

$Vertex = (2, \; -(2)^2 + 4(2) + 8)$

$Vertex = (2, \; -(2)(2) + 4(2) + 8)$

$Vertex = (2, \; -4 + 8 + 8)$

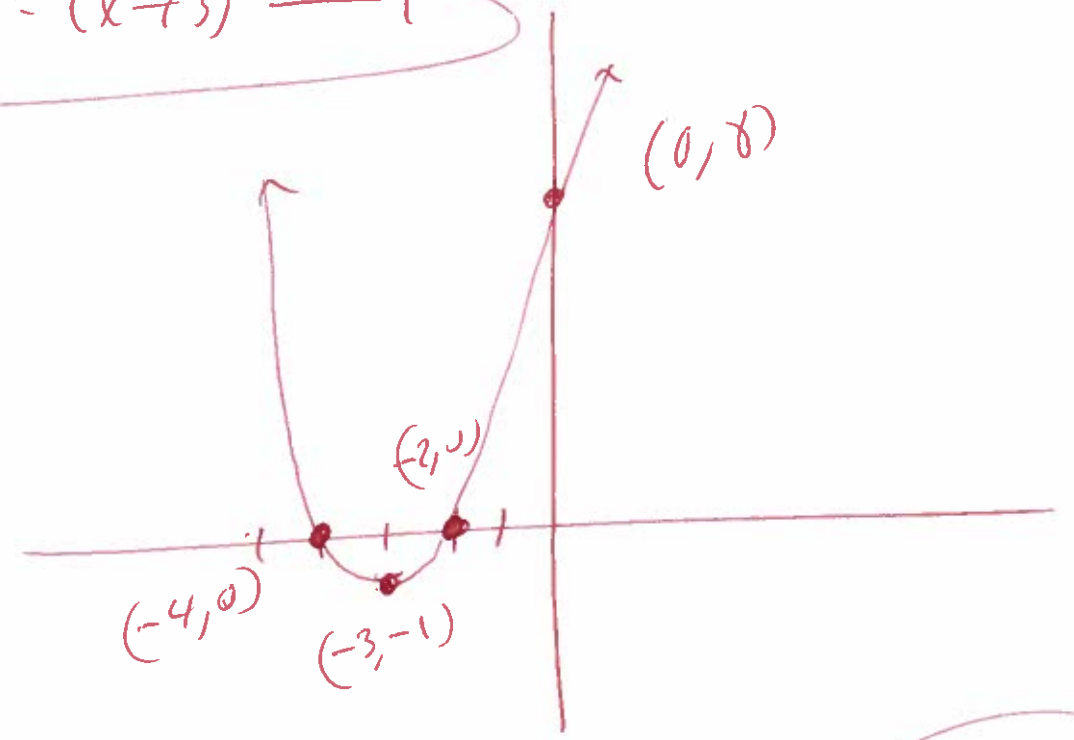
$Vertex = (2, \; 4 + 8)$

$Vertex = (2, \; 12)$

6) $f(x) = (x+3)^2 - 1$

Graph

$y_1 = (x+3)^2 - 1$



Xmin = -12
Xmax = 12
Xscl = 1

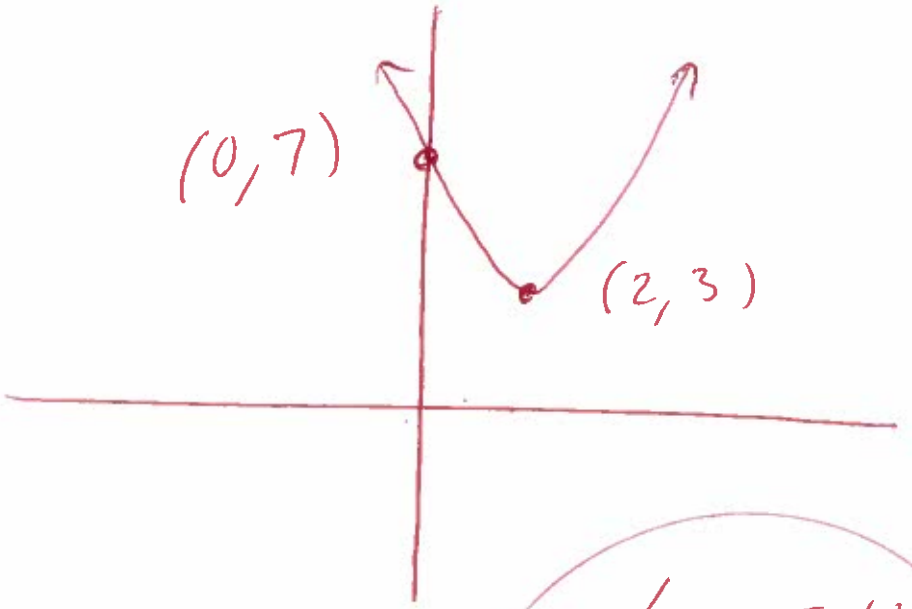
Ymin = -10
Ymax = 10
Yscl = 1

(7d)

graph

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

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



$X_{min} = -12$

$X_{max} = 12$

$X_{scl} = 1$

$y_{min} = -10$

$y_{max} = 10$

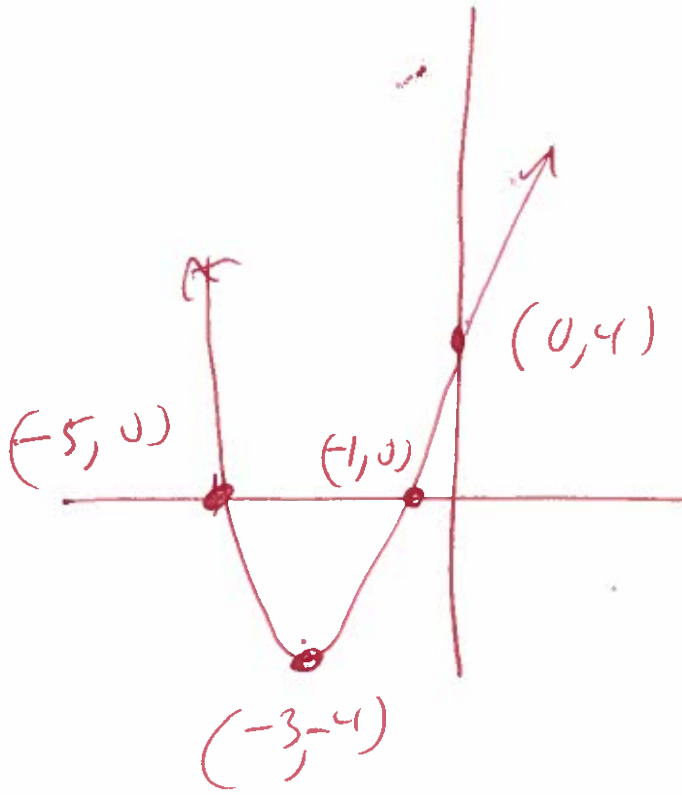
$y_{scl} = 1$

71)

graph

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

$y_1 = x^2 + 6x + 5$



$X_{min} = -12$

$X_{max} = 12$

$X_{scl} = 1$

$Y_{min} = -10$

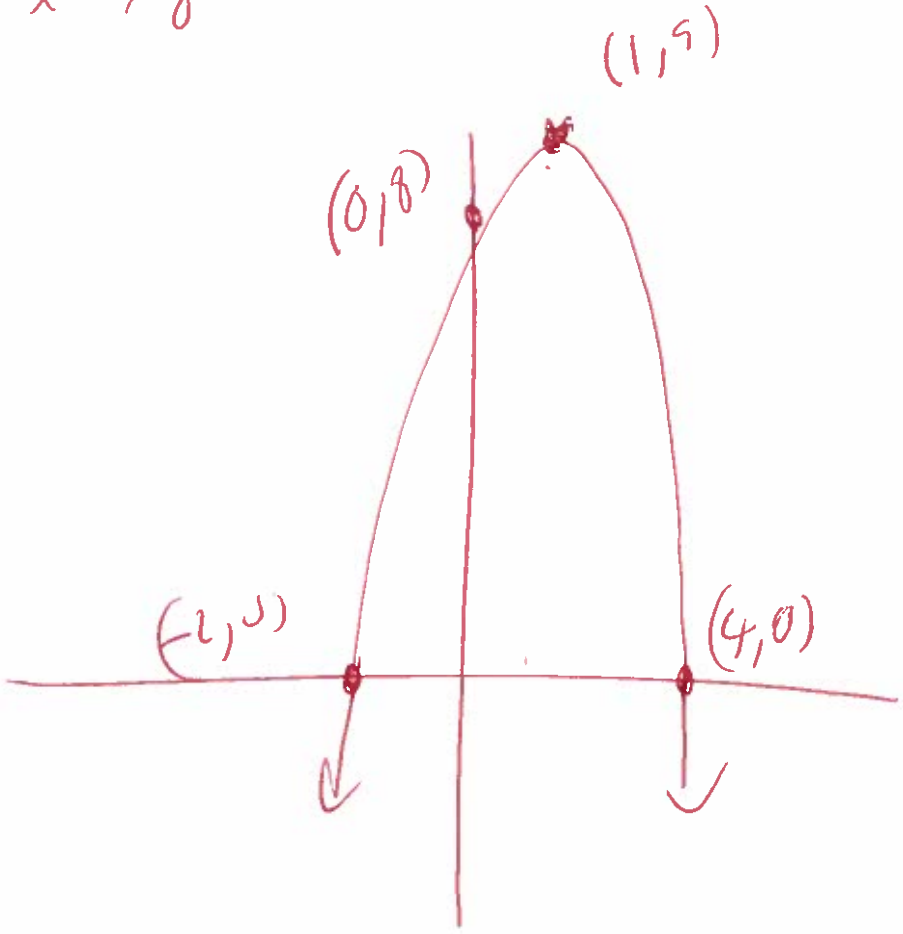
$Y_{max} = 10$

$Y_{scl} = 1$

graph

(12) $f(x) = 4x - x^2 + 8$

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



$X_{min} = -12$

$X_{max} = 12$

$X_{scl} = 1$

$y_{min} = -10$

$y_{max} = 10$

$y_{scl} = 1$

(73.) $x^3 - 5x^2 + 2x + 8 = 0$

Given $x = -1$ is a zero

$$\begin{array}{r|rrrr} -1 & 1 & -5 & 2 & 8 \\ & & -1 & 6 & -8 \\ \hline & 1 & -6 & 8 & 0 \text{ rem} \end{array}$$

$x^2 - 6x + 8 = 0$

$(x-2)(x-4) = 0$

so $x-2=0$ or $x-4=0$

$x-2+2=0+2$ or $x-4+4=0+4$

$x=2$ or $x=4$

$x=-1,\ x=2,\ x=4$

(14) $f(x) = 5x^3 - 7x^2 - 45x + 63$

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

$\frac{\pm 63}{5} =$

Possible

$\pm 1, \pm 3, \pm 9, \pm 7, \pm 21, \pm 63, \pm \frac{1}{5}, \pm \frac{3}{5}, \pm \frac{9}{5}, \pm \frac{7}{5}, \pm \frac{21}{5}, \pm \frac{63}{5}$

Use synthetic division

3)	5	−7	−45	63
		15	24	−63
	5	8	−21	0 ← R

Possible: 21, 5·1, 3·7

$5x^2 + 8x - 21 = 0$

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

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

$5x - x + 1 = 0 + 7$ OR $x + 3 - 3 = 0 - 3$

$5x = 7$ OR $x = -3$

$\frac{5x}{5} = \frac{7}{5}$

$x = \frac{7}{5}$

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

(76) $f(x) = \dfrac{5x^2 - 4x + 7}{x - 2}$

Use Synthetic division

find Slant asymptote

$$\begin{array}{r|rrr} 2 & 5 & -4 & 7 \\ & & 10 & 12 \\ \hline & 5 & 6 & (19) \text{ rem} \end{array}$$

$y = 5x + 6$

77.

$f(x) = \frac{x}{x+5}$ find vertical asymptote

set $x+5=0$

$x+5-5=0-5$

$x=-5$ vertical asymptote

(78) find vertical asymptote

$$f(x) = \frac{x-2}{x^2-9x+14}$$

$$f(x) = \frac{x-2}{(x-2)(x-7)}$$

hole at $x-2=0$

$x-2+2=0+2$

$x=2$

$$f(x) = \frac{1(x-2)}{(x-2)(x-7)}$$

$$f(x) = \frac{1}{x-7}$$

set $x-7=0$

$x-7+7=0+7$

$x=7$

Vertical asymptote

(19)

$f(x) = \frac{19x}{6x^2+5}$ find horizontal asymptote

$y = \text{Horiz Asym} = \frac{19x}{6x^2}$

$y = HA = \frac{19}{6x}$

$\lim_{x \to \infty} \frac{19}{6x} =$

$\frac{19}{6} \lim_{x \to \infty} \frac{1}{x} =$ facts

$\frac{19}{6}(0) =$

$0 =$

$y = 0$ horizontal asymptote

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

$y = \text{Horz Asym} = \frac{14x^2}{7x^2}$

$y - HA = \frac{14}{7}$

$y = HA = 2$

horizontal asymptote

Find domain

(81) $f(x) = \log(12 - x)$

$f(A) = \log(Ax + B)$
let $Ax + B > 0$

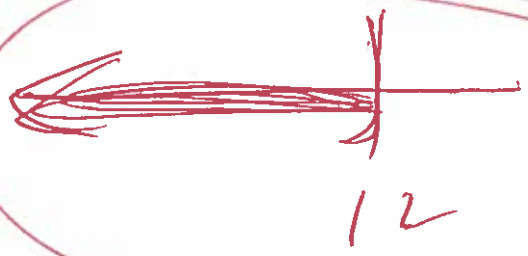
let $12 - x > 0$

$12 - x - 12 > 0 - 12$

$-x > -12$

$\frac{-x}{-1} < \frac{-12}{-1}$

$x < 12$



12

$(-\infty, 12)$

(82) $\log_b\left(\frac{x^2y}{z^4}\right)$ expand

$\log_b(x^2y) - \log_b(z^4) =$

$\log_b(x^2) + \log_b(y) - \log_b(z^4) =$

$2\log_b(x) + \log_b(y) - 4\log_b(z) =$

formulas

$\log_b\left(\frac{A}{B}\right)$

$\log_b(A) - \log_b(B)$

$\log_b(AB) =$

$\log_b(A) + \log_b(B) =$

$\log_b(A^N) = N\log_b(A)$

(83) $\ln\left(\frac{x^9\sqrt{x^2+4}}{(x+4)^6}\right)$ expand =

$\ln\left(x^9\sqrt{x^2+4}\right) - \ln(x+4)^6 =$

$\ln(x^9) + \ln\sqrt{x^2+4} - \ln(x+4)^6 =$

$\ln(x^9) + \ln(x^2+4)^{1/2} - \ln(x+4)^6 =$

$9\ln(x) + \frac{1}{2}\ln(x^2+4) - 6\ln(x+4) =$

formulas

$\ln\left(\frac{A}{B}\right) = \ln(A) - \ln(B)$

$\ln(AB) = \ln(A) + \ln(B)$

$\ln(A^N) = N\ln(A)$

(84) $25^{x+4} = 625^{x-6}$

$(5^2)^{x+4} = (5^4)^{x-6}$

$5^{2x+8} = 5^{4x-24}$

$2x+8 = 4x-24$

$2x+8-8 = 4x-24-8$

$2x = 4x-32$

$2x-4x = 4x-32-4x$

$-2x = -32$

$\frac{-2x}{-2} = \frac{-32}{-2}$

$x = 16$

35. $2e^{7x} = 1188$

$\frac{2e^{7x}}{2} = \frac{1188}{2}$

$e^{7x} = \frac{1188}{2}$

$e^{7x} = 594$

$\ln(e^{7x}) = \ln(594)$

$7x \ln(e) = \ln(594)$

$7x(1) = \ln(594)$

$7x = \ln(594)$

$\frac{7x}{7} = \frac{\ln(594)}{7}$

$x = \frac{\ln(594)}{7}$ OR $x = .912411 3313$

Round

$x = 0.91$

(26) $7^{x-2} = 414$

$\ln(7^{x-2}) = \ln(414)$

$(x-2)\ln(7) = \ln(414)$

$\frac{(x-2)\ln(7)}{\ln(7)} = \frac{\ln(414)}{\ln(7)}$

$x-2 = \frac{\ln(414)}{\ln(7)}$

$x-2+2 = \frac{\ln(414)}{\ln(7)} + 2$

$x = \frac{\ln(414)}{\ln(7)} + 2$

$x = 5.096682535$

OR Round

$x = 5.10$

(87) $\log_2(x+16) = 2$

$2^2 = x+16$ rewrite

$4 = x+16$

$4-16 = x+16-16$

$-12 = x$

Check

$\log_2(-12+16) = 2$

$\log_2(4) = 2$

Good

(88) $\log_3(x) + \log_3(2x-1) = 1$

$\log_3(x)(2x-1) = 1$

$3^1 = x(2x-1)$

$3 = 2x^2 - x$

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

$0 = (2x-3)(x+1)$

$2x-3=0$ OR $x+1=0$

$2x-3+3=0+3$ OR $x+1-1=0-1$

$2x = 3$ OR $x = -1$

$\frac{2x}{2} = \frac{3}{2}$

$x = \frac{3}{2}$

Check

answer

$\left\{\frac{3}{2}\right\}$

$\log_3(x) + \log_3(2x-1) = 1$

$\log_3\left(\frac{3}{2}\right) + \log_3\left(2\left(\frac{3}{2}\right)-1\right) = 1$

$\log_3\left(\frac{3}{2}\right) + \log_3(3-1) = 1$

$\log_3\left(\frac{3}{2}\right) + \log_3(2) = 1$

Good Good

$\log_3(-1) + \log_3(2(-1)-1) = 1$

$\log_3(-1) + \log_3(-2-1) = 1$

$\log_3(-1) + \log_3(-3) = 1$

BAD BAD

(89) $\log_5(x+116) + \log_5(x-4) = 4$

$\log_5 (x+116)(x-4) = 4$

$5^4 = (x+116)(x-4)$

$625 = x^2 - 4x + 116x - 464$

$625 = x^2 + 112x - 464$

$625 - 625 = x^2 + 112x - 464 - 625$

$0 = x^2 + 112x - 1089$

$0 = (x-9)(x+121)$

answer $\{9\}$

let $x-9=0$ OR $x+121=0$

$x-9+9=0+9$ OR $x+121-121=0-121$

$x=9$ OR $x=-121$

Check

$\log_5(x+116) + \log_5(x-4) = 4$

$\log_5(9+116) + \log_5(9-4) = 4$

$\log_5(125) + \log_5(5) = 4$

Good Good

$\log_5(-121+116) + \log_5(-121-4) = 4$

$\log_5(-5) + \log_5(-125) = 4$

BAD BAD

(96) $\log_2(x+5) - \log_2(x-2) = 3$

$\log_2\left(\frac{x+5}{x-2}\right) = 3$

$2^3 = \frac{x+5}{x-2}$

$8 = \frac{x+5}{x-2}$

$8(x-2) = 1(x+5)$

$8x - 16 = 1x + 5$

$8x - 16 + 16 = 1x + 5 + 16$

$8x = 1x + 21$

$8x - 1x = 1x + 21 - 1x$

$7x = 21$

$\frac{7x}{7} = \frac{21}{7}$

answer

$\{3\}$

$x = 3$ check

$\log_2(3+5) - \log_2(3-2) = 3$

$\log_2(8) - \log_2(1) = 3$

Good Good

(91) $\log(x) + \log(x-4) = \log(21)$

$\log(x)(x-4) = \log(21)$

$x(x-4) = 21$

$x^2 - 4x = 21$

$x^2 - 4x - 21 = 0$

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

$x+3=0$ OR $x-7=0$

$x+3-3=0-3$ OR $x-7+7=0+7$

$x=-3$ OR $x=7$

Answer: $\{7\}$

Check

$\log(x) + \log(x-4) = \log(21)$

$\log(-3) + \log(-3-4) = \log(21)$

$\log(-3) + \log(-7) = \log(21)$

BAD BAD

$\log(7) + \log(7-4) = \log(21)$

$\log(7) + \log(3) = \log(21)$

Good Good Good

(92) $A = 21.2e^{0.0411t}$

$A = 21.2e^{0.0411(0)}$

$A = 21.2e^{0}$ (0, 21.2)

$A = 21.2(1)$

$A = 21.2$

$29.8 = 21.2e^{0.0411t}$

$\frac{29.8}{21.2} = \frac{21.2e^{0.0411t}}{21.2}$

$1.405660377 = e^{0.0411t}$

$\ln(1.405660377) = \ln(e^{0.0411t})$

$\ln(1.405660377) = 0.0411t\ln(e)$

$\ln(1.405660377) = 0.0411t(1)$

$\ln(1.405660377) = 0.0411t$

$\ln(1.405660377) = \frac{0.0411t}{0.0411}$

$\frac{0.0411}{0.0411} = t$

8.284846997 years

8.28 Round

2000 + 8.284846997

2008.284846997

2008 Round

(93.) $A = P\left(1 + \frac{r}{n}\right)^{nt}$

$21000 = 1300\left(1 + \frac{.052}{2}\right)^{2t}$

$21000 = 1300\left(1 + .026\right)^{2t}$

$21000 = 1300\left(1.026\right)^{2t}$

$\frac{21000}{1300} = \frac{1300\left(1.026\right)^{2t}}{1300}$

$1.615384615 = \left(1.026\right)^{2t}$

$\ln(1.615384615) = \ln\left(1.026\right)^{2t}$

$\ln(1.615384615) = 2t \ln(1.026)$

$\frac{\ln(1.615384615)}{\ln(1.026)} = \frac{2t \ln(1.026)}{\ln(1.026)}$

$18.50820169 = 2t$

$\frac{18.50820169}{2} = \frac{2t}{2}$

$9.254100845 = t$

Round

$9.3 = t$

Formula

$\ln(A^N) = N \ln A$

(94)

$A = 16e^{-0.000121t}$

$(-0.000121(5527))$

$A = 16e$

$A = 16(.5123399036)$

$A = 8.197438458$

OR

Round

$A = 8$

formula

$\ln(e) = 1$

(95)

$A = A_0 e^{-0.000121t}$

$20 = 100 e^{-0.000121t}$

$\frac{20}{100} = \frac{100 e^{-0.000121t}}{100}$

$.20 = e^{-0.000121t}$

$\ln(.20) = \ln(e^{-0.000121t})$

$\ln(.20) = -0.000121t \ln(e)$

$\ln(.20) = -0.000121t (1)$

$\ln(.20) = -0.000121t$

$\frac{\ln(.20)}{-0.000121} = \frac{-0.000121t}{-0.000121}$

$13301.13977 = t$

Round

$13,301 = t$

Formula

$\ln(A^N) = N\ln(A)$

$\ln(e) = 1$

(6)

$A = 6e^{0.003t}$

double

$12 = 6e^{0.003t}$

$r = 0.3$

$\frac{12}{6} = \frac{6e^{0.003t}}{6}$

$2 = e^{0.003t}$

$\ln(2) = \ln(e^{0.003t})$

$\ln(2) = 0.003t \ln(e)$

$\ln(2) = 0.003t(1)$

$\ln(2) = 0.003t$

$\frac{\ln(2)}{0.003} = \frac{0.003t}{0.003}$

$231.049060 = t$

Round

$231 = t$

(97) $x+y+7z=35$

$x+y+4z=20$

$x+3y-4z=-28$

2ND, Matrix, Edit, [A], 3X4,

$$[A]=\begin{bmatrix} 1 & 1 & 7 & 35 \\ 1 & 1 & 4 & 20 \\ 1 & 3 & -4 & -28 \end{bmatrix}$$

Use graphing Calculator

2ND Quit

2ND, Matrix, Math, rref

rref([A]) enter

$$\begin{bmatrix} 1 & 0 & 0 & 4 \\ 0 & 1 & 0 & -4 \\ 0 & 0 & 1 & 5 \end{bmatrix}$$

$(x, y, z) = (4, -4, 5)$

(98) find 1st four terms of the sequence

$$a_n = \frac{2n}{n+1}$$

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

$$a_2 = \frac{2(2)}{2+1} = \frac{4}{3}$$

$$a_3 = \frac{2(3)}{3+1} = \frac{6}{4} = \frac{2(3)}{2(2)} = \frac{3}{2}$$

$$a_4 = \frac{2(4)}{4+1} = \frac{8}{5}$$

(99) $\sum_{k=1}^{3} k(k+2)$

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

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

$3 + 8 + 15 =$

$11 + 15 =$

$26 =$

(10) use binomial theorem

$(3x-1)^3$

$\binom{3}{3,0}(3x)^3(-1)^0 + \binom{3}{3,1}(3x)^2(-1)^1 + \binom{3}{3,2}(3x)^1(-1)^2 + \binom{3}{3,3}(3x)^0(-1)^3 =$

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

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

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

for math

$$(A+B)^N = \binom{N}{N,0}(A)^N(B)^0 + \binom{N}{N,1}(A)^{N-1}(B)^1 + \ldots + \binom{N}{N,N}(A)^0(B)^N$$

3 math Prb, ncr 0 = 1

3 math Prb, ncr 1 = 3

3 math Prb, ncr 2 = 3

3 math Prb, ncr 3 = 1

3

(10) write 1st three terms (use Binomial theorem)

$(x+8)^4 =$

$C(4,0)(x)^4(8)^0 + C(4,1)(x)^3(8)^1 + C(4,2)(x)^2(8)^2 =$

$(1)(x^4)(1) + (4)(x^3)(8) + (6)(x^2)(64) =$

$x^4 + 32x^3 + 384x^2 =$

formula

$(A+B)^N = C(N,0)(A)^N(B)^0 + C(N,1)(A)^{N-1}(B)^1 + \ldots + C(N,N)(A)^0(B)^N$

4, Math, Prb, nCr, 0 = 1

4, Math, Prb, nCr, 1 = 4

4, Math, Prb, nCr, 2 = 6