

① $5x - 4 \leq 6x - 2x$

$$5x - 4 \leq 4x$$

$$5x - 4 + 4 \leq 4x + 4$$

$$5x \leq 4x + 4$$

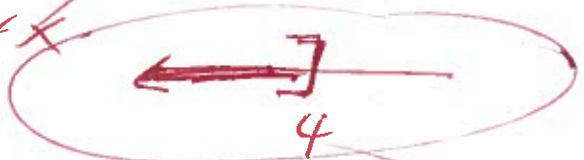
$$5x - 4x \leq 4x + 4 - 4x$$

$$1x \leq 4$$

$$x \leq 4$$

M0320 Homework 101 Step
11-06-17

①

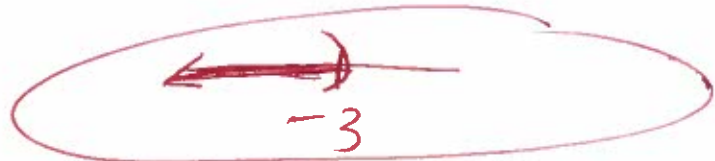


$$(-\infty, 4]$$

② $2x < -6$

$$\frac{2x}{2} < \frac{-6}{2}$$

$$x < -3$$



$$(-\infty, -3)$$

③ $-8x \leq 32$

$$\frac{-8x}{-8} \geq \frac{32}{-8}$$

$$x \geq -4$$

divide by a negative and
turn the direction around.



$$[-4, \infty)$$

$$4 \quad 2x - 6 < 8x + 18$$

$$2x - \cancel{6} + 6 < 8x + 18 + 6$$

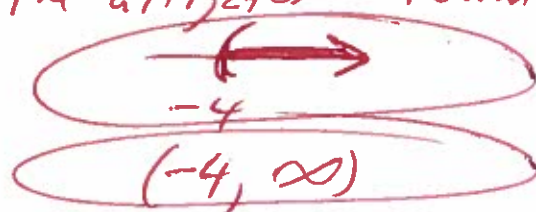
$$2x < 8x + 24$$

$$2x - 8x < \cancel{8x} + 24 - \cancel{8x}$$

$$-6x < 24$$

$$\frac{-6x}{-6} > \frac{24}{-6} \quad \text{Divide by a negative and turn the alligator around.}$$

$$x > -4$$



5.

$$-4x + 2 \geq 2(4 - x)$$

$$-4x + 2 \geq 8 - 2x$$

$$-4x + \cancel{2} - \cancel{2} \geq 8 - 2x - 2$$

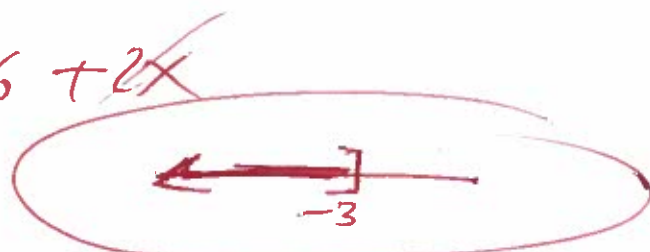
$$-4x \geq -2x + 6$$

$$-4x + 2x \geq \cancel{-2x} + 6 + \cancel{2x}$$

$$-2x \geq 6$$

$$\frac{-2x}{-2} \leq \frac{6}{-2}$$

$$x \leq -3$$



Divide by a negative and turn the alligator around.

6. graph

$$y = -2x + 1$$

$$y = -2(0) + 1$$

$$y = 0 + 1$$

$$y = 1$$

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

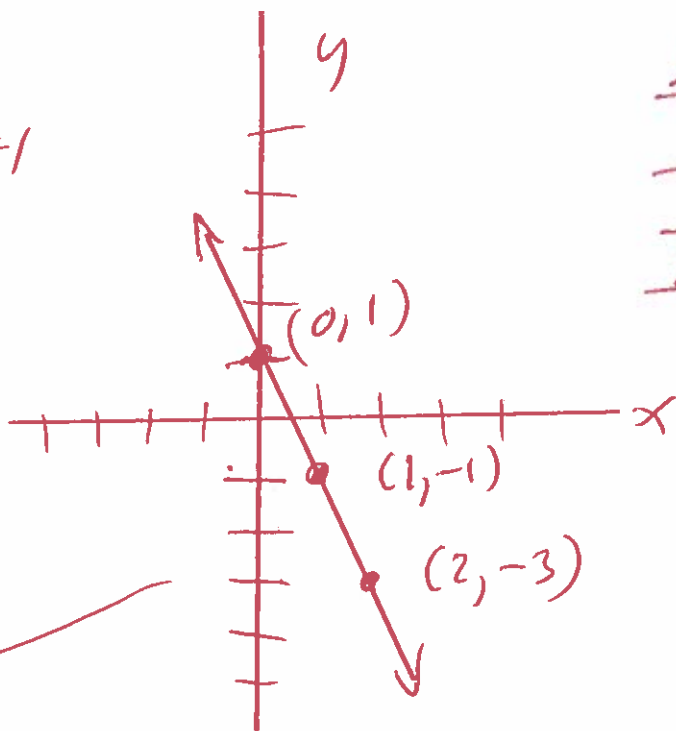
$$y = -2 + 1$$

$$y = -1$$

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

$$y = -4 + 1$$

$$y = -3$$



x	y
0	1
1	-1
2	-3

3.

7. given $f(x) = 2x + 5$ find $f(-1)$, $f(0)$, $f(2)$

$$f(-1) = 2(-1) + 5$$

$$f(-1) = -2 + 5$$

$$f(-1) = 3$$

$$f(0) = 2(0) + 5$$

$$f(0) = 0 + 5$$

$$f(0) = 5$$

$$f(2) = 2(2) + 5$$

$$f(2) = 4 + 5$$

$$f(2) = 9$$

8 Given $f(x) = |x+8|$ find $f(7)$, $f(-7)$, $f(0)$

$$f(7) = |7+8|$$

$$f(7) = |15|$$

$$f(7) = 15$$

$$f(-7) = |-7+8|$$

$$f(-7) = |1|$$

$$f(-7) = 1$$

$$f(0) = |0+8|$$

$$f(0) = |8|$$

$$f(0) = 8$$

9 Given $h(x) = 2x^2 - 1$, find $h(-4)$, $h(0)$, $h(5)$

$$h(-4) = 2(-4)^2 - 1$$

$$h(-4) = 2(-4)(-4) - 1$$

$$h(-4) = 2(16) - 1$$

$$h(-4) = 32 - 1$$

$$h(-4) = 31$$

$$h(0) = 2(0)^2 - 1$$

$$h(0) = 2(0)(0) - 1$$

$$h(0) = 2(0) - 1$$

$$h(0) = 0 - 1$$

$$h(0) = -1$$

$$h(5) = 2(5)^2 - 1$$

$$h(5) = 2(5)(5) - 1$$

$$h(5) = 2(25) - 1$$

$$h(5) = 50 - 1$$

$$h(5) = 49$$

10. Given $f(x) = 6x + 3$ find $f(7)$, $f(5)$

$$f(7) = 6(7) + 3$$

$$f(7) = 42 + 3$$

$$f(7) = 45 \quad \checkmark$$

(5)

$$f(5) = 6(5) + 3$$

$$f(5) = 6 \cdot 5 + 3 \quad \checkmark$$

11. Given $f(x) = x^2 - 7$, find $f(7)$, $f(a)$

$$f(7) = (7)^2 - 7$$

$$f(7) = (7)(7) - 7$$

$$f(7) = 49 - 7$$

$$f(7) = 42 \quad \checkmark$$

$$f(a) = (a)^2 - 7$$

$$f(a) = (a)(a) - 7$$

$$f(a) = a^2 - 7 \quad \checkmark$$

12. Divide using synthetic division

$$(6x^2 + 11x + 9) \div (x + 1)$$

$$\begin{array}{r|rrr} -1 & 6 & 11 & 9 \\ & & -6 & -5 \\ \hline & 6 & 5 & 4 \end{array} \text{ rem}$$

$$6x + 5 + \frac{4}{x+1}$$

divide use long division

$$\underline{6x^2 + 11x + 9}$$

$$x + 1$$

$$6x + 5 + \frac{4}{x+1}$$

$$\begin{array}{r} x+1 \overline{) 6x^2 + 11x + 9} \end{array}$$

$$\underline{-(6x^2 + 6x)}$$

$$\begin{array}{r} 5x + 9 \\ \underline{-(5x + 5)} \end{array}$$

$$4 \text{ rem}$$

13) factor by grouping

$$2x + 16 + xy + 8y =$$

$$(2x + 16) + (xy + 8y) =$$

11

$$2(x + 8) + y(x + 8) =$$

$$(x + 8)(2 + y) =$$

14) factor by grouping

$$3x^2 - 9xy - 4x + 12y =$$

$$(3x^2 - 9xy) + (-4x + 12y) =$$

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

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

15) factor

$$8xy - 54x^2 =$$

$$2x(4y - 27x)$$

16. factor GCF

$$3x^3y - 9x^2y + 12xy =$$

$$3xy(x^2 - 3x + 4) =$$

8

17. factor

$$-48x^6y^5 - 40x^8y^4 =$$

$$8x^6y^4(-6y - 5x^2) =$$

18. factor

$$x^2 - 49 =$$

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

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

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

19. factor

$$16x^2 - 25 =$$

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

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

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

20 factor

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

$$81x^2 - 121y^2 =$$

$$(9x)^2 - (11y)^2 =$$

$$(9x+11y)(9x-11y) =$$

9

21 factor

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

$$x^2 - \frac{1}{49} =$$

$$(x)^2 - \left(\frac{1}{7}\right)^2 =$$

$$\left(x + \frac{1}{7}\right)\left(x - \frac{1}{7}\right) =$$

22 solve

$$(x-2)(x+8) = 0$$

but $x-2=0$ OR $x+8=0$

$x-2+2=0+2$ OR $x+8-8=0-8$

$$x=2$$

$$OR \ x=-8$$

23

solve

$$(3x+7)(6x-7) = 0$$

but $3x+7=0$ OR $6x-7=0$

$3x+7-7=0-7$ OR $6x-7+7=0+7$

$$3x=-7$$

OR

$$6x=7$$

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

OR

$$\frac{6x}{6} = \frac{7}{6}$$

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

$$OR \ x = \frac{7}{6}$$

24.

Solve

$$x^2 + 3x - 40 = 0$$

$$(x-5)(x+8) = 0$$

either $x-5=0$ or $x+8=0$

$$x-5+5=0+5 \quad \text{or} \quad x+8-8=0-8$$

$x=5$ or $x=-8$

Possible

- 40.1
- 20.2
- 10.4
- 8.5

10

25.

Solve

$$x^2 - 9x = 0$$

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

either $x=0$ or $x-9=0$

$$x-9+9=0+9$$

$x=9$

26.

Solve

$$x^2 - 7x = 18$$

$$x^2 - 7x - 18 = 18 - 18$$

$$x^2 - 7x - 18 = 0$$

$$(x+2)(x-9) = 0$$

either $x+2=0$ or $x-9=0$

$$x+2-2=0-2 \quad \text{or} \quad x-9+9=0+9$$

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

Possible

- 18.1
- 9.2
- 6.3

27

Solve

$$12x^2 + 80x = 28$$

$$12x^2 + 80x - 28 = 28 - 28$$

Possible

(11)

$$12x^2 + 80x - 28 = 0$$

3, 1 3, 1

$$4(3x^2 + 20x - 7) = 0$$

$$4(3x - 1)(x + 7) = 0$$

Set ~~4=0~~ OR $3x - 1 = 0$ OR $x + 7 = 0$

$$3x - 1 + 1 = 0 + 1 \quad \text{OR} \quad x + 7 - 7 = 0 - 7$$

$$3x = 1$$

OR

$$x = -7$$

$$\frac{3x}{3} = \frac{1}{3}$$

$$x = \frac{1}{3}$$

28

Solve

$$x^3 - 10x^2 + 21x = 0$$

possible

2, 1

3, 2

(0, 3, 7)

$$x(x^2 - 10x + 21) = 0$$

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

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

$$x - 3 + 3 = 0 + 3 \quad \text{OR} \quad x - 7 + 7 = 0 + 7$$

$$x = 3$$

$$x = 7$$

29

Solve

$$(8x-3)(64x^2-48x+9)=0$$

$$(8x-3)(8x-3)(8x-3)=0$$

Let $8x-3=0$ OR $8x-3=0$ OR $8x-3=0$

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

$8x=3$ OR $8x=3$ OR $8x=3$

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

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

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

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

Same

possible
64.1
32.2
16.4
8.8

9.1
3.3

12

$(\frac{3}{8}, \frac{3}{8})$

30

Solve

$$36x^2 - x = 0$$

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

$$x(36x^2 - 1) = 0$$

$$x((6x)^2 - (1)^2) = 0$$

$$x(6x+1)(6x-1) = 0$$

Let $x=0$ OR $6x+1=0$ OR $6x-1=0$

$6x+1-1=0-1$ OR $6x-1+1=0+1$

$6x=-1$ OR $6x=1$

$\frac{6x}{6} = \frac{-1}{6}$ OR $\frac{6x}{6} = \frac{1}{6}$

$x = -\frac{1}{6}$

OR $x = \frac{1}{6}$

$\{0, -\frac{1}{6}, \frac{1}{6}\}$

31.

Solve

$$60x^3 - 14x^2 - 8x = 0$$

$$2x(30x^2 - 7x - 4) = 0$$

$$2x(15x + 4)(2x - 1) = 0$$

Let $2x = 0$ OR $15x + 4 = 0$ OR $2x - 1 = 0$

$$\frac{2x}{2} = \frac{0}{2} \text{ OR } 15x + 4 - 4 = 0 - 4 \text{ OR } 2x - 1 + 1 = 0 + 1$$

$$x = 0 \text{ OR } 15x = -4 \text{ OR } 2x = 1$$

$$\frac{15x}{15} = \frac{-4}{15} \text{ OR } \frac{2x}{2} = \frac{1}{2}$$

$$x = -\frac{4}{15}$$

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

$$\left\{0, -\frac{4}{15}, \frac{1}{2}\right\}$$

possibly
30.1
15.2
6.5
10.3

4.1
2.2

13

32.

Solve

$$x^2 - 16 = -6x$$

$$x^2 - 16 + 6x = -6x + 6x$$

$$x^2 + 6x - 16 = 0$$

$$(x - 2)(x + 8) = 0$$

Let $x - 2 = 0$ OR $x + 8 = 0$

$$x - 2 + 2 = 0 + 2 \text{ OR } x + 8 - 8 = 0 - 8$$

$$x = 2$$

$$x = -8$$

$$\{2, -8\}$$

possibly
6.1
2.8
4.4

33 Solve
 $12x^2 - 7x - 12 = 0$

possible
 $\begin{matrix} 12 \cdot 1 \\ 6 \cdot 2 \\ 3 \cdot 4 \end{matrix}$ $\begin{matrix} 12 \cdot 1 \\ 6 \cdot 2 \\ 3 \cdot 4 \end{matrix}$ 14

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

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

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

$4x = -3$ OR $3x = 4$

$\frac{4x}{4} = \frac{-3}{4}$ OR $\frac{3x}{3} = \frac{4}{3}$ $\left\{ -\frac{3}{4}, \frac{4}{3} \right\}$

$x = -\frac{3}{4}$ OR $x = \frac{4}{3}$

34 Solve

$5x^2 - 3x + 4 = 0$

$\begin{matrix} 5 \cdot 1 \\ 14 \cdot 1 \\ 2 \cdot 7 \end{matrix}$

$(5x + 7)(x - 2) = 0$

Let $5x + 7 = 0$ OR $x - 2 = 0$

$5x + 7 - 7 = 0 - 7$ OR $x - 2 + 2 = 0 + 2$

$5x = -7$ OR $x = 2$

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

$x = -\frac{7}{5}$ $\left\{ -\frac{7}{5}, 2 \right\}$

35.

Solve

$$4x^2 - 6x - 54 = 0$$

$$(2x + 6)(2x - 9) = 0$$

$$\text{Let } 2x + 6 = 0 \text{ OR } 2x - 9 = 0$$

$$2x + 6 - 6 = 0 - 6 \text{ OR } 2x - 9 + 9 = 0 + 9$$

$$2x = -6$$

OR

$$2x = 9$$

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

OR

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

$$x = -3$$

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

$$\{-3, \frac{9}{2}\}$$

4.1
22

54.1
27.2
6.9
10.3

15.

36.

find domain

$$f(x) = \frac{3x}{11-x}$$

$$\text{Let } 11-x=0$$

$$11-x-11=0-11$$

$$-x = -11$$

$$\frac{-x}{-1} = \frac{-11}{-1}$$

$$x = 11$$



$$(-\infty, 11) \cup (11, \infty)$$

$$\{x \mid x \neq 11\}$$

domain

$$\{x \mid x \text{ is a real number at } x \neq 11\}$$

37. find domain

$$C(x) = \frac{x+4}{x^2-9}$$

16.
formula $a^2 - b^2 = (a+b)(a-b)$

let $x^2 - 9 = 0$

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

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

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

$$x+3-3=0-3 \quad \text{or} \quad x-3+3=0+3$$

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



$$(-\infty, -3) \cup (-3, 3) \cup (3, \infty)$$

$$\{x \mid x \text{ is a real number and } x \neq -3 \text{ or } x \neq 3\}$$

38. Simplify

$$\frac{5}{35a-10} =$$

$$\frac{\cancel{5}(1)}{\cancel{5}(7a-2)} =$$

$$\frac{1}{7a-2} =$$

39. Simplify

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

$$\frac{-6(x-y)}{(x-y)} =$$

$$-6 =$$

40. Simplify

$$\frac{6x-30}{x^2-5x} =$$

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

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

41. Simplify

$$\frac{x+4}{x^2-x-20} =$$

$$\frac{(x+4)}{(x+4)(x-5)} =$$

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

$$\frac{1}{x-5}$$

possibly
20.1
10.2
4.5

17

42. Simplify

$$\frac{3x^2 + 10x + 8}{x+2} =$$

Possibly

$$\begin{matrix} 3 \cdot 1 \\ 8 \cdot 1 \\ 2 \cdot 4 \end{matrix}$$

13.

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

$$3x+4 =$$

43. Simplify

$$\frac{4x^2 - 100}{12x - 60} =$$

$$\frac{4(x^2 - 25)}{12(x-5)} =$$

$$\frac{4(x^2 - (5)^2)}{12(x-5)} =$$

$$\frac{4(x+5)(x-5)}{12(x-5)} =$$

$$\frac{4(x+5)(\cancel{x-5})}{12(\cancel{x-5})} =$$

$$\frac{4(3)(x-5)}{12(x-5)} =$$

$$\frac{x+5}{3} =$$

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

(44) Given $f(x) = \frac{x+12}{2x-1}$ find $f(4)$, $f(0)$, $f(-3)$

$$f(4) = \frac{(4)+12}{2(4)-1}$$

$$f(4) = \frac{4+12}{8-1}$$

$$f(4) = \frac{16}{7}$$

(19)

$$f(0) = \frac{(0)+12}{2(0)-1}$$

$$f(0) = \frac{0+12}{0-1}$$

$$f(0) = \frac{12}{-1}$$

$$f(0) = -12$$

$$f(-3) = \frac{(-3)+12}{2(-3)-1}$$

$$f(-3) = \frac{-3+12}{-6-1}$$

$$f(-3) = \frac{9}{-7}$$

45. Given $g(x) = \frac{x^2 + 8}{x^3 - 25x}$ find $g(3)$, $g(-1)$, $g(1)$

$$g(3) = \frac{(3)^2 + 8}{(3)^3 - 25(3)}$$

$$g(3) = \frac{(3)(3) + 8}{(3)(3)(3) - 25(3)}$$

$$g(3) = \frac{9 + 8}{27 - 75}$$

$$g(3) = \frac{17}{-48}$$

$$g(-1) = \frac{(-1)^2 + 8}{(-1)^3 - 25(-1)}$$

$$g(-1) = \frac{(-1)(-1) + 8}{(-1)(-1)(-1) - 25(-1)}$$

$$g(-1) = \frac{1 + 8}{-1 + 25}$$

$$g(-1) = \frac{9}{24}$$

$$g(-1) = \frac{\cancel{3}(3)}{\cancel{3}(8)}$$

$$g(-1) = \frac{3}{8}$$

20.

$$g(1) = \frac{(1)^2 + 8}{(1)^3 - 25(1)}$$

$$g(1) = \frac{(1)(1) + 8}{(1)(1)(1) - 25(1)}$$

$$g(1) = \frac{1 + 8}{1 - 25}$$

$$g(1) = \frac{9}{-24}$$

$$g(1) = \frac{\cancel{3}(3)}{\cancel{3}(-8)}$$

$$g(1) = -\frac{3}{8}$$

(46)

Simplify

$$\frac{18x^1}{9} \cdot \frac{x^5}{2x^3} =$$

$$\frac{18x^{1+5}}{18x^3} =$$

$$\frac{18x^6}{18x^3} =$$

$$x^{6-3} =$$

$$x^3 =$$

(21)

(47)

Simplify

$$\frac{x}{5x-20} \cdot \frac{x^2-4x}{9} =$$

$$\frac{x}{5(x-4)} \cdot \frac{x(x-4)}{9} =$$

$$\frac{x^2}{45} =$$

48. Simplify

$$\frac{2x+2}{5} \cdot \frac{10}{16x+16} =$$

$$\frac{2(\cancel{x+1})}{5} \cdot \frac{10}{16(\cancel{x+1})} =$$

$$\frac{20}{80} =$$

$$\frac{20(1)}{20(4)} =$$

$$\frac{1}{4} =$$

22.

49. Simplify

$$\frac{x^2-64}{x^2-5x-24} \cdot \frac{x+3}{x} =$$

$$\frac{(x)^2-(8)^2}{x^2-5x-24} \cdot \frac{(x+3)}{x} =$$

$$\frac{(x+8)(x-8)}{(x+3)(x-8)} \cdot \frac{(x+3)}{x} =$$

$$\frac{(x+8)(\cancel{x-8})}{(x+3)(\cancel{x-8})} \cdot \frac{(x+3)}{x} =$$

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

for math $a^2-b^2 = (a+b)(a-b)$

possible

24:1

12:2

6:4

3:8

50. $\frac{r^2 - s^2}{r - s} \div \frac{r}{r^2 - s^2} =$

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

23

$\frac{r^2 - s^2}{r - s} \cdot \frac{r^2 - s^2}{r} =$

$\frac{(r+s)(r-s)}{\cancel{r-s}} \cdot \frac{\cancel{r}(r-s)}{\cancel{r}} =$

$(r+s)(r-s) =$

$r^2 - r^2 + r^2 - s^2 =$

$r^2 - s^2$

51. Simplify

$\frac{x+2}{8-x} \div \frac{x^2 - 13x + 36}{x^2 - 17x + 72} =$

$\frac{x+2}{8-x} \cdot \frac{x^2 - 17x + 72}{x^2 - 13x + 36} =$

$\frac{x+2}{8-x} \cdot \frac{(x-8)(x-9)}{(x-4)(x-9)} =$

$\frac{(x+2)}{-1(x-8)} \cdot \frac{\cancel{(x-8)}(x-9)}{\cancel{(x-9)}(x-4)} \quad \text{rewrite}$

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

$-\frac{x+2}{x-4} =$
 rewrite

52

simplify

$$\frac{x^2 + 10x + 16}{x-1} \div \frac{x^2 - x - 6}{x-1}$$

$$\frac{x^2 + 10x + 16}{x-1} \cdot \frac{x-1}{x^2 - x - 6} =$$

$$\frac{(x+2)(x+8)}{(x-1)} \cdot \frac{(x-1)}{(x+2)(x-3)} =$$

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

possibly

$$\frac{16 \cdot 1}{2 \cdot 8} = 44$$

24

$$\frac{6 \cdot 7}{2 \cdot 3} =$$

53

simplify

$$\frac{2x-12}{75} \div \frac{25x-150}{50}$$

$$\frac{2x-12}{75} \cdot \frac{50}{25x-150} =$$

$$\frac{2(x-6)}{75} \cdot \frac{50}{25(x-6)}$$

$$\frac{2(50)}{75(25)} =$$

$$\frac{2(2)(25)}{75(25)} =$$

$$\frac{4}{75} =$$

54. Simplify

$$\frac{5}{4x^2 - 9} \div \frac{15}{20x^2 - 50} =$$

$$\frac{5}{4x^2 - 9} \cdot \frac{20x^2 - 50}{15} =$$

$$\frac{5}{\cancel{(4x^2 - 9)}} \cdot \frac{5 \cancel{(4x^2 - 9)}}{15} =$$

$$\frac{25}{15} =$$

$$\frac{5(5)}{5(3)} =$$

$$\frac{5}{3} =$$

25.

55.

$$\frac{8x}{4x-7} - \frac{14}{4x-7} =$$

$$\frac{8x - 14}{4x - 7} =$$

$$\frac{2 \cancel{(4x - 7)}}{\cancel{(4x - 7)}} =$$

$$2 =$$

56

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

(2)

$$\frac{(3) + (y+2)}{9+y} =$$

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

$$\frac{y+5}{9+y} =$$

57

$$\frac{7x^2+4x}{x-6} - \frac{4(x+30)}{x-6} =$$

$$\frac{(7x^2+4x) - (4(x+30))}{x-6} =$$

$$\frac{7x^2+4x-4x-30}{x-6} =$$

$$\frac{7x^2-37x-30}{x-6} =$$

$$\frac{(7x+5)(x-6)}{(x-6)} =$$

$$7x+5 =$$

possible
7.1
30.1
15.2
10.3
6.5

58.

$$\frac{5x-11}{x^2-7x-8} - \frac{4x-12}{x^2-7x-8} =$$

(27)

$$\frac{(5x-11) - (4x-12)}{x^2-7x-8} =$$

$$\frac{5x-11-4x+12}{x^2-7x-8} =$$

$$\frac{x+1}{x^2-7x-8} =$$

$$\frac{(x+1)}{(x+1)(x-8)} =$$

$$\frac{1(x+1)}{(x+1)(x-8)} =$$

$$\frac{1}{x-8} =$$

59. graph

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

$$f(0) = -2(0) + 6$$

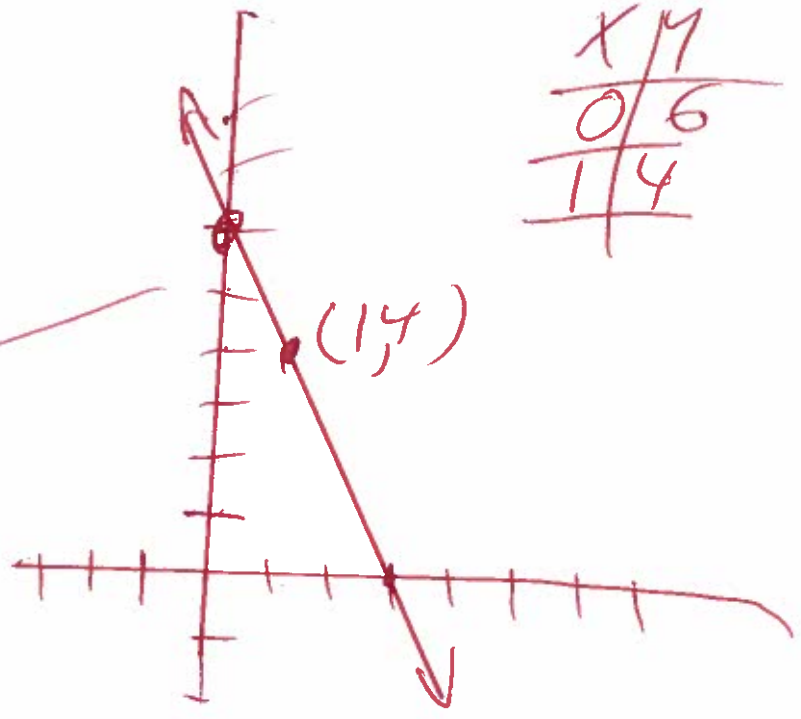
$$f(0) = 0 + 6$$

$$f(0) = 6$$

$$f(1) = -2(1) + 6$$

$$f(1) = -2 + 6$$

$$f(1) = 4$$



x	y
0	6
1	4

23

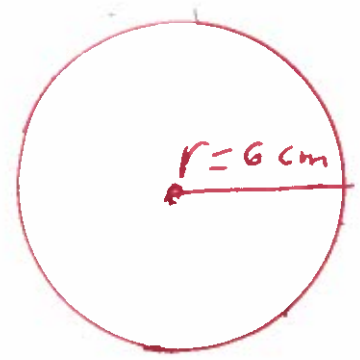
60. $A(r) = \pi r^2$ Evd if $r = 6$

$$A(6) = \pi (6)^2$$

$$A(6) = \pi (6)(6)$$

$$A(6) = \pi (36)$$

$$A(6) = 36\pi$$



61. graph

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

$$x = 0, 1, 2, 3, 4$$

$$y = (0)^2 - 4(0) + 12$$

$$y = (0)(0) - 4(0) + 12$$

$$y = 0 - 0 + 12$$

$$y = 12$$

$$y = (1)^2 - 4(1) + 12$$

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

$$y = 1 - 4 + 12$$

$$y = -3 + 12$$

$$y = 9$$

$$y = (2)^2 - 4(2) + 12$$

$$y = (2)(2) - 4(2) + 12$$

$$y = 4 - 8 + 12$$

$$y = -4 + 12$$

$$y = 8$$

$$y = (3)^2 - 4(3) + 12$$

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

$$y = 9 - 12 + 12$$

$$y = 9$$

$$y = (4)^2 - 4(4) + 12$$

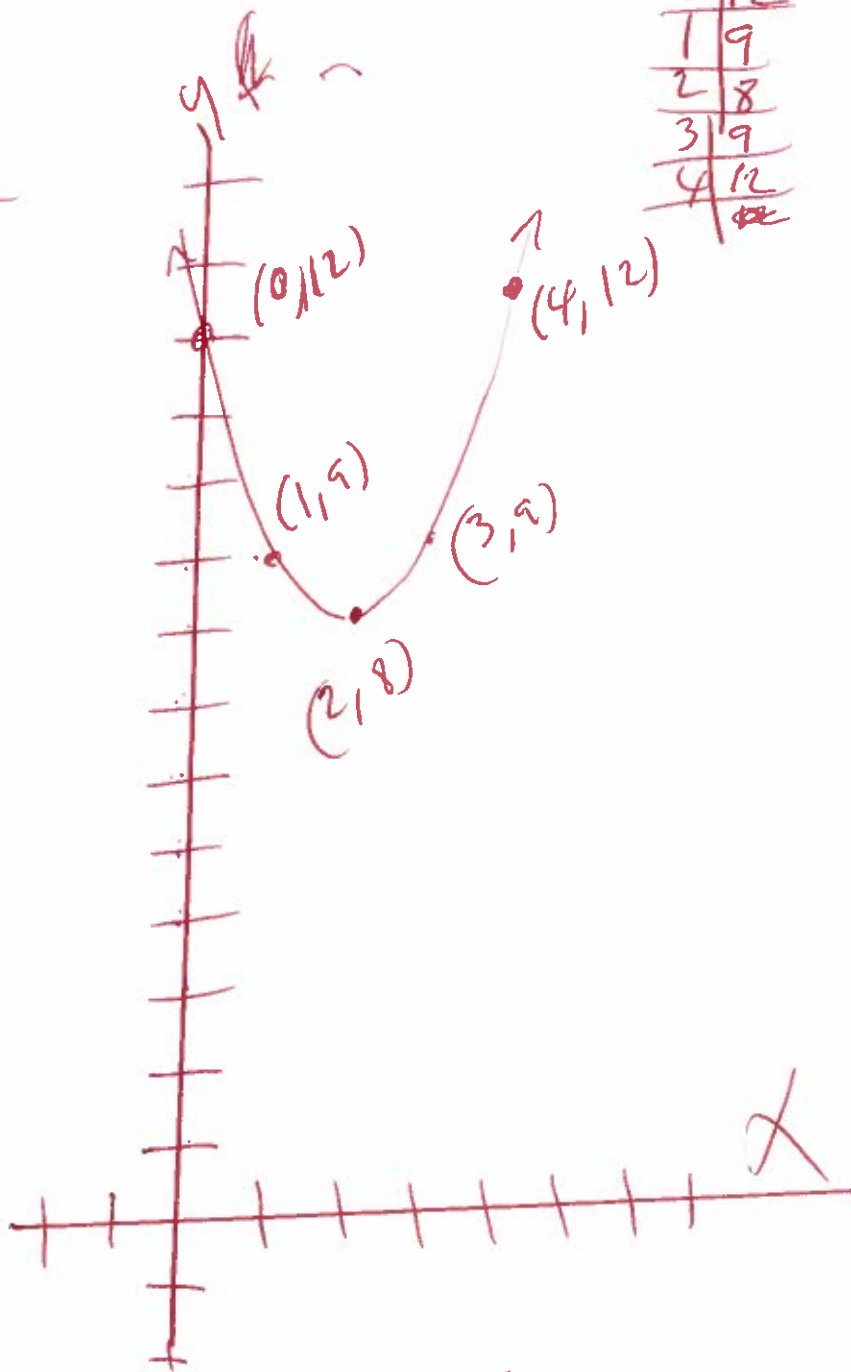
$$y = (4)(4) - 4(4) + 12$$

$$y = 16 - 16 + 12$$

$$y = 12$$

x	y
0	12
1	9
2	8
3	9
4	12

291



$$62 \quad -20 \leq 2x - 10 \leq 4$$

$$-20 + 10 \leq 2x - 10 + 10 \leq 4 + 10$$

$$-10 \leq 2x \leq 14$$

$$\frac{-10}{2} \leq \frac{2x}{2} \leq \frac{14}{2}$$

$$-5 \leq x \leq 7$$



$$[-5, 7]$$

63

$$|2x - 11| = 17$$

formula

$$|x| = a$$

$$x = -a \text{ OR } x = a$$

$$\text{wt } 2x - 11 = -17 \text{ OR } 2x - 11 = 17$$

$$2x - 11 + 11 = -17 + 11 \text{ OR } 2x - 11 + 11 = 17 + 11$$

$$2x = -6 \text{ OR } 2x = 28$$

$$\frac{2x}{2} = \frac{-6}{2} \text{ OR } \frac{2x}{2} = \frac{28}{2}$$

$$x = -3$$

$$\text{OR } x = 14$$



$$\textcircled{64.} \quad |x-2| < 6$$

$$-6 < x-2 < 6$$

$$-6+2 < x-2+2 < 6+2$$

$$-4 < x < 8$$



$$(-4, 8)$$

formula

$$|x| < a$$

$$-a < x < a$$

31/

$$\textcircled{65.} \quad |x+9| \geq 13$$

wt

$$x+9 \leq -13 \quad \text{OR} \quad x+9 \geq 13$$

$$x+9-9 \leq -13-9 \quad \text{OR} \quad x+9-9 \geq 13-9$$

$$x \leq -22 \quad \text{OR} \quad x \geq 4$$



$$(-\infty, -22] \cup [4, \infty)$$

formula

$$|x| \geq a$$

$$x \leq -a \quad \text{OR} \quad x \geq a$$

66 $\sqrt{484} =$ use calculator

$22 =$

32

67 Simplify

$\sqrt{9x^6} =$

$\sqrt{3^2 x^6} =$

Primes 2, 3, 5, 7

$$\begin{array}{r} 3 \overline{) 9} \\ \underline{3} \\ 1 \end{array}$$

$3^1 x^3 =$ divide powers

$3x^3 =$

Primes 2, 3, 5, 7

68 $\sqrt[3]{-27x^{15}} =$

$\sqrt[3]{(-3)^3 x^{15}} =$

$$\begin{array}{r} 3 \overline{) 27} \\ \underline{3} \\ 9 \\ \underline{3} \\ 3 \\ \underline{3} \\ 1 \end{array}$$

$(-3)^1 x^5 =$ divide powers

$-3x^5 =$

69 $\sqrt{121x^{14}} =$

$\sqrt{11^2 x^{14}} =$

$11^1 x^7 =$ divide powers

Primes 2, 3, 5, 7, 11

$$\begin{array}{r} 11 \overline{) 121} \\ \underline{11} \\ 11 \\ \underline{11} \\ 1 \end{array}$$

$11x^7 =$

$$\textcircled{70} \sqrt{16x^{26}} =$$

Primes 2, 3, 5, 7

$$\sqrt{2^4 x^{26}} =$$

$$2^2 x^{13} = \text{divide powers}$$

$$2 \cdot 2 x^{13} =$$

$$4x^{13} =$$

$$2 \overline{)16}$$

$$2 \overline{)8}$$

$$2 \overline{)4}$$

$$2 \overline{)2}$$

$$1$$

(35)

$$\textcircled{71} \sqrt[3]{27x^3} =$$

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

$$\sqrt[3]{3^3 x^3} =$$

$$3^1 x^1 = \text{divide powers}$$

$$3x =$$

$$3 \overline{)27}$$

$$3 \overline{)9}$$

$$3 \overline{)3}$$

$$1$$

$$\textcircled{72} \sqrt{25a^6b^{30}} =$$

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

$$\sqrt{5^2 a^6 b^{30}} =$$

$$5^1 a^3 b^{15} = \text{divide powers}$$

$$5a^3 b^{15} =$$

$$5 \overline{)25}$$
$$5 \overline{)5}$$
$$1$$

$$\textcircled{73} \sqrt{49a^{10}b^{34}} =$$

$$\sqrt{7^2 a^{10} b^{34}} =$$

$$7^1 a^5 b^{17} =$$

$$\textcircled{7a^5 b^{17}} =$$

Prime 2, 3, 5, 7, ...

$$\begin{array}{r} \cancel{70} \\ \cancel{47} \\ \hline 1 \end{array}$$

$\textcircled{34}$

$$\textcircled{74} \sqrt[3]{-64x^{12}y^9} =$$

$$\sqrt[3]{(-4)^3 x^{12} y^9} =$$

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

$$\textcircled{-4x^4 y^3} =$$

Prime

$$\begin{array}{r} \cancel{2} \cancel{64} \\ \cancel{2} \cancel{32} \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{2} \cancel{16} \\ \cancel{2} \cancel{8} \\ \hline \end{array}$$

$$\begin{array}{r} \cancel{2} \cancel{4} \\ \cancel{2} \cancel{2} \\ \hline \end{array}$$

$$\textcircled{(-4)^3 = -64}$$

$$\textcircled{75} f(x) = \sqrt{3x+17} \quad \text{find } f(0)$$

$$f(0) = \sqrt{3(0)+17}$$

$$f(0) = \sqrt{0+17}$$

$$\textcircled{f(0) = \sqrt{17}}$$

76 $f(x) = \sqrt{2x+3}$ find $f(2)$

$f(2) = \sqrt{2(2)+3}$

$f(2) = \sqrt{4+3}$

$f(2) = \sqrt{7}$

35

77 $5(2^{\frac{1}{3}})$ Prime 2, 3, 5, 7, ...

$(2^9)^{\frac{1}{3}} =$

$(2^{\frac{9}{1}})^{\frac{1}{3}} =$

$2^{\frac{9}{3}} =$

$2^3 =$

$2 \cdot 2 \cdot 2 =$

$8 =$

2 | 512
 2 | 256
 2 | 128
 2 | 64
 2 | 32
 2 | 16
 2 | 8
 2 | 4
 2 | 2
 1

78 $1024^{\frac{3}{5}}$ Prime 2, 3, 5, 7, ...

$(2^{10})^{\frac{3}{5}} =$

$(2^{\frac{10}{1}})^{\frac{3}{5}} =$

$2^{\frac{30}{5}} =$

$2^6 =$
 $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 =$

$64 =$

2 | 1024
 2 | 512
 2 | 256
 2 | 128
 2 | 64
 2 | 32
 2 | 16
 2 | 8
 2 | 4
 2 | 2
 1

79) $\sqrt{50}$ = Prims 2, 3, 5, 7

$\sqrt{5^2 \cdot 2}$ = divide powers

$5^1 \sqrt{2} =$

$$\begin{array}{r} 2 \overline{) 50} \\ \underline{40} \\ 10 \\ \underline{10} \\ 0 \end{array}$$
 36

$5\sqrt{2} =$

80) $\sqrt[3]{1250}$ = Prims 2, 3, 5, 7

$\sqrt[3]{5^4 \cdot 2^1} =$

$\sqrt[3]{5^3 \cdot 5^1 \cdot 2^1} =$

$5^1 \sqrt[3]{5^1 \cdot 2^1} =$ divide powers

$$\begin{array}{r} 2 \overline{) 1250} \\ \underline{1000} \\ 250 \\ \underline{250} \\ 0 \end{array}$$

$5 \sqrt[3]{10} =$

81) $\sqrt{49x^5}$ = Prims 2, 3, 5, 7

$\sqrt{7^2 x^5} =$

$\sqrt{7^2 x^4 x^1} =$

$7^1 x^2 \sqrt{x} =$ divide powers

$7x^2 \sqrt{x} =$

$$\begin{array}{r} 7 \overline{) 49} \\ \underline{49} \\ 0 \end{array}$$

82 $\sqrt[3]{32x^7} =$

Primes 2, 3, 5, 7...

$$\sqrt[3]{2^5 x^7} =$$

$$\sqrt[3]{2^3 \cdot 2^2 \cdot x^6 \cdot x^1} =$$

$$\begin{array}{r} 2 \overline{) 32} \\ \underline{20} \\ 12 \\ \underline{10} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

37

$$2^1 x^2 \sqrt[3]{2^2 x^1} = \text{divide powers}$$

$$2^1 x^2 \sqrt[3]{2 \cdot 2 \cdot x} =$$

$$2x^2 \sqrt[3]{4x} =$$

83 $\sqrt{25a^2b^3} =$

Primes 2, 3, 5, 7...

$$\sqrt{5^2 a^2 b^3} =$$

$$\begin{array}{r} 5 \overline{) 25} \\ \underline{50} \\ 0 \end{array}$$

$$\sqrt{5^2 a^2 b^2 b^1} =$$

$$5^1 a^1 b^1 \sqrt{b^1} = \text{divide powers}$$

$$5ab\sqrt{b} =$$

84. $\sqrt[3]{81x^{15}y^4}$ = Primes 2, 3, 5, 7...

38

$$\sqrt[3]{3^4 x^{15} y^4} =$$

$$\begin{array}{r} 3 \overline{) 81} \\ 3 \overline{) 27} \\ 3 \overline{) 9} \\ 3 \overline{) 3} \\ 1 \end{array}$$

$$\sqrt[3]{\underline{3^3} \cdot 3^1 x^{15} y^{\underline{3} y^1}} =$$

$$3^1 x^5 y^1 \sqrt[3]{3^1 y^1} =$$

$$3x^5y \sqrt[3]{3y} =$$

85. solve

$$\sqrt{x-13} = 4$$

$$(\sqrt{x-13})^2 = (4)^2$$

$$x-13 = (4)(4)$$

$$x-13 = 16$$

$$x - \cancel{13} + \cancel{13} = 16 + 13$$

$$x = 29$$

$$\begin{aligned} 86 \quad (9-9i) + (2+8i) &= \\ 9-9i+2+8i &= \\ 11-1i &= \\ \boxed{11-i} &= \end{aligned}$$

39

$$\begin{aligned} 87. \quad (4+3i) - (8-6i) &= \\ 4+3i-8+6i &= \\ \boxed{-4+9i} &= \end{aligned}$$

$$\begin{aligned} 88. \quad (3+9i)(4+i) &= \\ 12+3i+36i+9i^2 &= \\ 12+39i+9i^2 &= \\ 12+39i+9(-1) &= \\ 12+39i-9 &= \\ \boxed{3+39i} &= \end{aligned}$$

89

$$\frac{5-6i}{5+i} =$$

40

$$\left(\frac{5-6i}{5+i}\right)\left(\frac{5-i}{5-i}\right) = \text{Mult}$$

$$\frac{25 - 5i - 30i + 6i^2}{25 - 5i + 5i - i^2} =$$

$$\frac{25 - 35i + 6i^2}{25 - i^2} =$$

$$\frac{25 - 35i + 6(-1)}{25 - (-1)} =$$

$$\frac{25 - 35i - 6}{25 + 1} =$$

$$\frac{19 - 35i}{26} =$$

$$\frac{19}{26} - \frac{35}{26}i =$$

$$(90) \quad (x+9)^2 = 16$$

(41)

$$\sqrt{(x+9)^2} = \pm\sqrt{16}$$

$$x+9 = \pm 4$$

$$x+9 = -4 \quad \text{OR}$$

$$x+9 = 4$$

$$x+9-9 = -4-9 \quad \text{OR}$$

$$x+9-9 = 4-9 \quad \checkmark$$

$$x = -13$$

OR

$$x = -5$$

ck

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

$$(-13+9)^2 = 16$$

$$(-4)^2 = 16$$

$$(-4)(-4) = 16$$

$$16 = 16 \quad \checkmark$$

ck

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

$$(-5+9)^2 = 16$$

$$(4)^2 = 16$$

$$(4)(4) = 16$$

$$16 = 16 \quad \checkmark$$

91) Use Quadratic formula

$$m^2 - 6m - 7 = 0$$

$$1m^2 - 6m - 7 = 0$$

$$a=1, b=-6, c=-7$$

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

$$m = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(-7)}}{2(1)}$$

$$m = \frac{6 \pm \sqrt{36 + 28}}{2}$$

$$m = \frac{6 \pm \sqrt{64}}{2}$$

$$m = \frac{6 \pm 8}{2}$$

$$m = 3 \pm 4$$

$$m = 3 - 4 \quad \text{OR} \quad m = 3 + 4$$

$$m = -1 \quad \text{OR} \quad m = 7$$

Solve by factoring

$$m^2 - 6m - 7 = 0$$

$$(m+1)(m-7) = 0$$

$$m+1=0 \quad \text{OR} \quad m-7=0$$

$$m+1-1=0-1 \quad \text{OR} \quad m-7+7=0+7$$

$$m = -1$$

$$\text{OR} \quad m = 7$$

Q2. Use Quadratic formula

$$8y = 4y^2 + 3$$

$$0 = 4y^2 + 3 - 8y$$

$$0 = 4y^2 - 8y + 3$$

$$a=4, b=-8, c=3$$

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

$$y = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(4)(3)}}{2(4)}$$

$$y = \frac{8 \pm \sqrt{64 - 48}}{8}$$

$$y = \frac{8 \pm \sqrt{16}}{8}$$

$$y = \frac{8 \pm 4}{8}$$

$$y = \frac{8+4}{8} \text{ OR } y = \frac{8-4}{8}$$

$$y = \frac{12}{8} \text{ OR } y = \frac{4}{8}$$

$$y = \frac{4(3)}{4(2)} \text{ OR } y = \frac{4(1)}{4(2)}$$

$$\text{OR } y = \frac{1}{2}$$

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

Solve by factoring

possible

$$\begin{pmatrix} 4 & 1 \\ 2 & 2 \end{pmatrix}$$

$$\begin{pmatrix} 3 & 1 \\ 2 & 1 \end{pmatrix}$$

$$4y^2 - 8y + 3 = 0$$

$$(2y-1)(2y-3) = 0$$

$$2y-1=0 \text{ OR } 2y-3=0$$

$$2y-1+1=0+1 \text{ OR } 2y-3+3=0+3$$

$$2y=1 \text{ OR } 2y=3$$

$$\frac{2y}{2} = \frac{1}{2} \text{ OR } \frac{2y}{2} = \frac{3}{2}$$

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

$$\text{OR } y = \frac{3}{2}$$

93. Use Quadratic Formula

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

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

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

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

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

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

$$x = \frac{4 \pm \sqrt{0}}{2}$$

$$x = \frac{4 \pm 0}{2}$$

$$x = \frac{4+0}{2} \quad \text{OR} \quad x = \frac{4-0}{2}$$

$$x = \frac{4}{2} \quad \text{OR} \quad x = \frac{4}{2}$$

$$x = 2$$

OR

$$x = 2$$

$$\{2\}$$

Solve by factoring

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

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

$$x-2=0 \quad \text{OR} \quad x-2=0$$

$$x-2+2=0+2 \quad \text{OR} \quad x-2+2=0+2$$

$$x = 2$$

$$\text{OR} \quad x = 2$$

$$\{2\}$$

44.

94 use Quadratic formula

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

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

$$a=1, b=-3, c=-3$$

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

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-3)}}{2(1)}$$

$$x = \frac{3 \pm \sqrt{9 + 12}}{2}$$

$$x = \frac{3 \pm \sqrt{21}}{2}$$

$$x = \frac{3 - \sqrt{21}}{2} \text{ or } x = \frac{3 + \sqrt{21}}{2}$$

$$\left\{ \frac{3 - \sqrt{21}}{2}, \frac{3 + \sqrt{21}}{2} \right\}$$

45

46

95) use Quadratic formula

$$10m^2 + 2m = 9$$

$$10m^2 + 2m - 9 = 0$$

$$a=10, b=2, c=-9$$

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

$$m = \frac{-(2) \pm \sqrt{(2)^2 - 4(10)(-9)}}{2(10)}$$

$$m = \frac{-2 \pm \sqrt{4 + 360}}{20}$$

Primes 2, 3, 5, 7

$$m = \frac{-2 \pm \sqrt{364}}{20}$$

$$\begin{array}{r} 2 \overline{) 364} \\ \underline{2} \\ 182 \\ \underline{182} \\ 0 \end{array}$$

$$m = \frac{-2 \pm \sqrt{4 * 91}}{20}$$

$$m = \frac{-2 \pm \sqrt{4} \sqrt{91}}{20}$$

$$m = \frac{-2 \pm 2\sqrt{91}}{20}$$

$$m = \frac{-1 - \sqrt{91}}{10} \text{ or } m = \frac{-1 + \sqrt{91}}{10}$$

$$m = \frac{2(-1 \pm \sqrt{91})}{2(10)}$$

$$\left\{ \frac{-1 - \sqrt{91}}{10}, \frac{-1 + \sqrt{91}}{10} \right\}$$

$$m = \frac{-1 \pm \sqrt{91}}{10}$$

96. Use Quadratic formula

$$x^2 + 4x + 29 = 0$$

$$(x^2 + 4x + 29 = 0)$$

$$a=1, b=4, c=29$$

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

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(29)}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{16 - 116}}{2}$$

$$x = \frac{-4 \pm \sqrt{-100}}{2}$$

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

$$x = -2 \pm 5i$$

$$x = -2 - 5i$$

$$\text{OR } x = -2 + 5i$$

$$\{-2 - 5i, -2 + 5i\}$$

47

formula

$$\sqrt{-1} = i$$

97 graph

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

$$f(-1) = (-1)^2 - 4$$

$$f(-1) = (-1)(-1) - 4$$

$$f(-1) = 1 - 4$$

$$f(-1) = -3$$

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

$$f(0) = (0)(0) - 4$$

$$f(0) = 0 - 4$$

$$f(0) = -4$$

$$f(1) = (1)^2 - 4$$

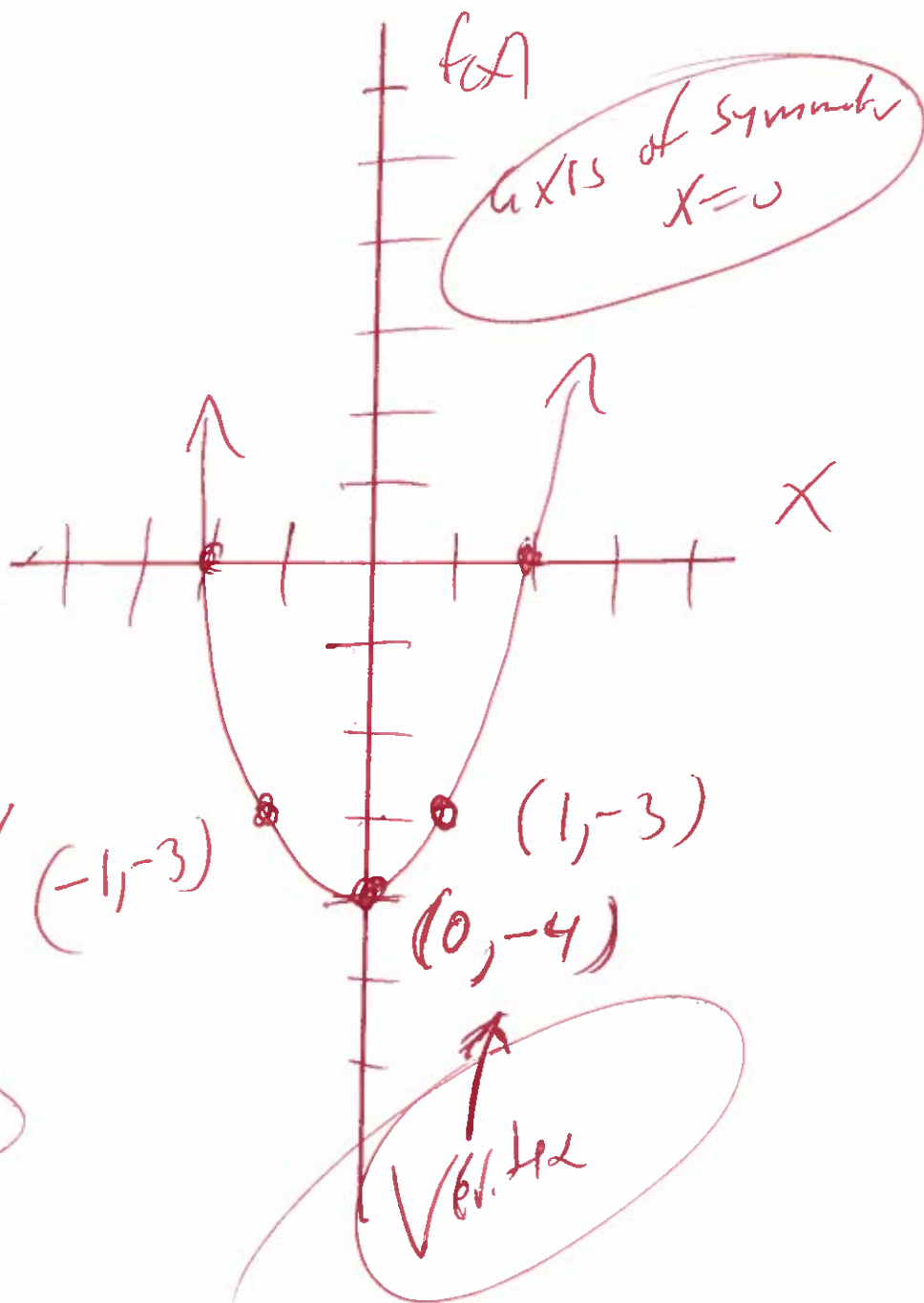
$$f(1) = (1)(1) - 4$$

$$f(1) = 1 - 4$$

$$f(1) = -3$$

X	f(x)
-1	-3
0	-4
1	-3

48



98. find vertex

$$f(x) = -5x^2 - 10x - 6$$

$$a = -5, b = -10, c = -6$$

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

$$\text{Vertex} = \left(\frac{-(-10)}{2(-5)}, f\left(\frac{-(-10)}{2(-5)}\right) \right)$$

$$\text{Vertex} = \left(\frac{10}{-10}, f\left(\frac{10}{-10}\right) \right)$$

$$\text{Vertex} = (-1, f(-1))$$

$$\text{Vertex} = (-1, -5(-1)^2 - 10(-1) - 6)$$

$$\text{Vertex} = (-1, -5(-1)(-1) - 10(-1) - 6)$$

$$\text{Vertex} = (-1, -5(1) - 10(-1) - 6)$$

$$\text{Vertex} = (-1, -5 + 10 - 6)$$

$$\text{Vertex} = (-1, 5 - 6)$$

$$\text{Vertex} = (-1, -1)$$

49

99.

$$y = 30 (2.7)^{-0.004t}$$

$-0.004t$

Eval if $t = 30$

use graphing calculator

$$y = 30 (2.7)^{-0.004(30)}$$

50.

$$y = 26.62916833$$

Round

$$y = 26.6$$

100.

Eval if $P = 5100$, $r = 7\%$, $N = 12$

$$A = P \left(1 + \frac{r}{N}\right)^{Nt}$$

$t = 5$

$12(\$)$

use graphing calculator

$$A = 5100 \left(1 + \frac{.07}{12}\right)^{12(5)}$$

$$A = 5100 \left(1 + .07/12\right)^{12(\$)}$$

$$A = 7229.888824$$

Round

$$= 7229.89$$

10. Eval if $P=9000$
 $r=5\%$
 $N=4$
 $t=9$

51

$$A = P \left(1 + \frac{r}{N}\right)^{Nt}$$

$$A = 9000 \left(1 + \frac{.05}{4}\right)^{4(9)}$$

use graphing calculator

$$A = 9000 \left(1 + .05/4\right)^{4(9)}$$

$$A = 14075.49437$$

Round

$$= 14075.49$$