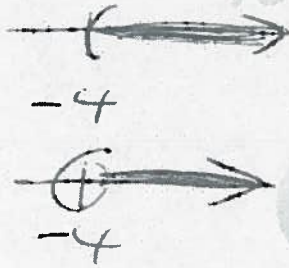


$$\textcircled{1} \quad 5x > -20$$

$$\frac{5x}{5} > \frac{-20}{5}$$

$$x > -4$$



Intermediate Algebra

$(-4, +\infty)$

Math 0320  
Dept Final Exam  
REVIEW

1

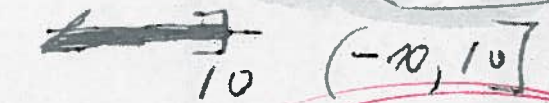
$$\textcircled{2} \quad 18 - 3x \geq -12$$

$$18 - 3x - 18 \geq -12 - 18$$

$$-3x \geq -30$$

$$\frac{-3x}{-3} \leq \frac{-30}{-3}$$

$$x \leq 10$$



6-2-14

118

Questions

$$\textcircled{3} \quad 9x - 8 \leq 4x - 12$$

$$9x - 8 + 8 \leq 4x - 12 + 8$$

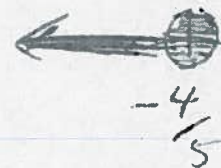
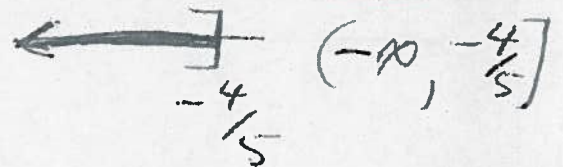
$$9x \leq 4x - 4$$

$$9x - 4x \leq 4x - 4 - 4x$$

$$5x \leq -4$$

$$\frac{5x}{5} \leq \frac{-4}{5}$$

$$x \leq -\frac{4}{5}$$



$$\textcircled{4} \quad 13 \leq 3x + 1 \leq 19$$

$$13 - 1 \leq 3x + 1 - 1 \leq 19 - 1$$

$$12 \leq 3x \leq 18$$

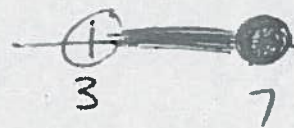
$$\frac{12}{3} \leq \frac{3x}{3} \leq \frac{18}{3}$$

$$4 \leq x \leq 6$$



$[4, 6]$

$$\begin{aligned} \textcircled{5} \quad & -13 \leq -2x+1 < -5 \\ & -13-1 \leq -2x+1-1 < -5-1 \\ & -14 \leq -2x < -6 \\ & \frac{-14}{-2} \geq \frac{-2x}{-2} > \frac{-6}{-2} \\ & 7 \geq x > 3 \\ & 3 < x \leq 7 \end{aligned}$$



$$(3, 7]$$

② ✓

$$\textcircled{6} \quad |r-2|=5$$

$$\begin{aligned} |x| &= a \\ x &= -a \text{ OR } x = a \end{aligned}$$

Set

$$r-2 = -5 \quad \text{OR} \quad r-2 = 5$$

$$r-2+2 = -5+2 \quad \text{OR} \quad r-2+2 = 5+2$$

$$r = -3 \quad \text{OR} \quad r = 7$$

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

$$\textcircled{7} \quad |x+6|-3 = 14$$

$$|x+6|-3+3 = 14+3$$

$$|x+6| = 17$$

$$x+6 = -17 \quad \text{OR} \quad x+6 = 17$$

$$x+6-6 = -17-6 \quad \text{OR} \quad x+6-6 = 17-6$$

$$x = -23 \quad \text{OR} \quad x = 11$$

$$\{-23, 11\}$$

$$8) |9x-4| = |x-7|$$

$$|x| = a$$

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

3 ✓

$$9x-4 = -(x-7) \text{ OR } 9x-4 = +(x-7)$$

$$9x-4 = -x+7$$

$$9x-4+4 = -x+7+4$$

$$9x = -x+11$$

$$9x+x = -x+11+x$$

$$10x = 11$$

$$\frac{10x}{10} = \frac{11}{10}$$

$$x = \frac{11}{10}$$

$$9x-4+4 = x-7+4$$

$$9x = x-3$$

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

$$8x = -3$$

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

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

$$\left\{ \frac{11}{10}, \frac{-3}{8} \right\}$$

$$9) |x+9| < 15$$

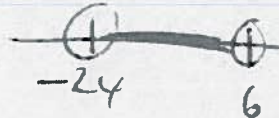
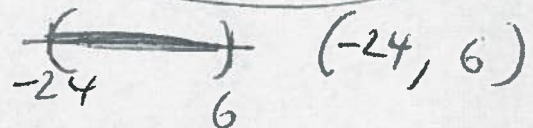
$$-15 < x+9 < 15$$

$$-15-9 < x+9-9 < 15-9$$

$$-24 < x < 6$$

$$|x| < a$$

$$-a < x < a$$



$$10) |x+6| > 16$$

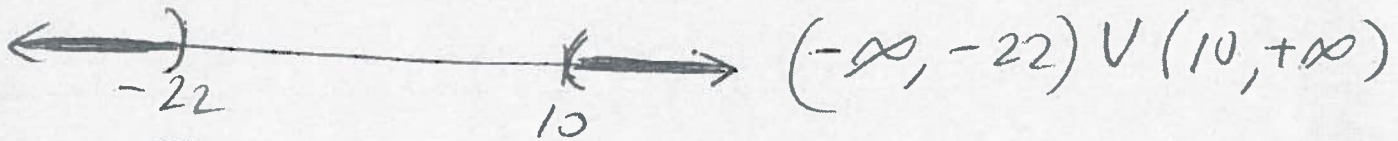
$$x+6 < -16 \text{ OR } x+6 > 16$$

$$x+6-6 < -16-6 \text{ OR } x+6-6 > 16-6$$

$$x < -22 \text{ OR } x > 10$$

$$|x| > a$$

$$x < -a \text{ OR } x > a$$



11) Graph  $y = 2x - 2$

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

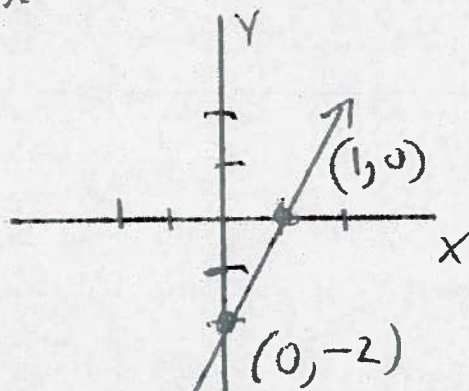
$$y = 0 - 2$$

$$y = -2$$

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

$$y = 2 - 2$$

$$y = 0$$



X	Y
0	-2
1	0

4 ✓

12) Graph  $2x - 3y = 6$

$$2x - 3y = 6$$

$$2x - 3y - 2x = 6 - 2x$$

$$-3y = 6 - 2x$$

$$\frac{-3y}{-3} = \frac{6}{-3} - \frac{2x}{-3}$$

$$y = -2 + \frac{2}{3}x$$

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

$$y = mx + b$$

X	Y
0	-2
3	0

$$y = \frac{2}{3}(0) - 2$$

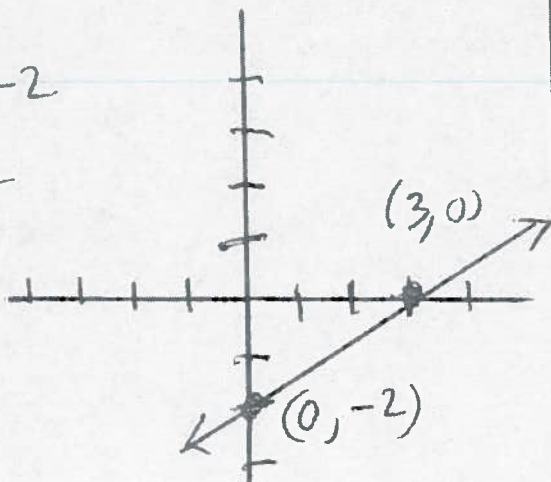
$$y = 0 - 2$$

$$y = -2$$

$$y = \frac{2}{3}(3) - 2$$

$$y = 2 - 2$$

$$y = 0$$



OR

Find the intercepts

$$2x - 3y = 6$$

Let  $x = 0$  find  $y$ -int

$$2(0) - 3y = 6$$

$$0 - 3y = 6$$

$$-3y = 6$$

$$\frac{-3y}{-3} = \frac{6}{-3}$$

$$y = -2$$

$$(0, -2)$$

Let  $y = 0$  to find  $x$ -int

$$2x - 3(0) = 6$$

$$2x - 0 = 6$$

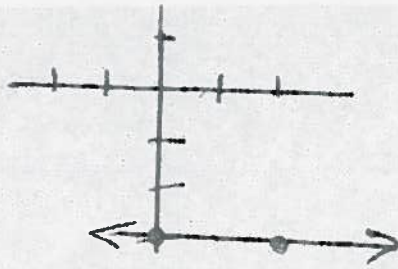
$$2x = 6$$

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

$$x = 3$$

$$(3, 0)$$

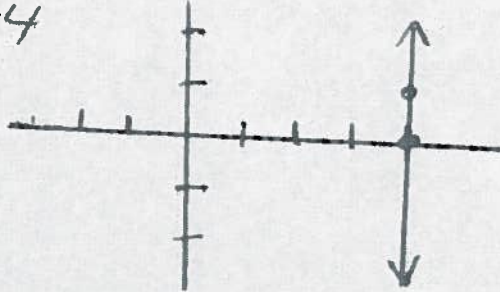
(13) Graph  $y = -3$



X	Y
0	-3
2	-3

9 ✓

(14) Graph  $x = 4$



X	Y
4	0
4	1

(15) Find the slope of the line through  
 $(8, 3)$  and  $(-4, 4)$ .

$x_1 \quad y_1 \qquad x_2 \quad y_2$

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$m = \frac{(3) - (4)}{(8) - (-4)}$$

$$m = \frac{3 - 4}{8 + 4}$$

$$m = \frac{-1}{12}$$

(16) Find the slope of the line through  
 $(-3, -9)$  and  $(-3, -1)$ .

$x_1 \quad y_1 \qquad x_2 \quad y_2$

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$m = \frac{(-9) - (-1)}{(-3) - (-3)}$$

$$m = \frac{-9 + 1}{-3 + 3}$$

$m = \frac{-8}{0}$   
undefined

- (17) Find the slope of the line through  
 $(-8, 8)$  and  $(1, 8)$   
 $x_1 \quad y_1 \quad x_2 \quad y_2$

6 ✓

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$m = \frac{(8) - (8)}{(-8) - (1)}$$

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

$$m = \frac{0}{-9}$$

$$m = 0$$

- (18) Find the slope and y-intercept  $y = 4x - 5$

$$y = mx + b$$

$$\text{slope} = m$$

$$y\text{-int} = (0, b)$$

$$m = 4 = \text{slope}$$

$$y\text{-int} = (0, -5)$$

- (19) Find the equation of the line with point  
 $(-3, 6)$  and slope  $= m = 3$ .  
 $x_1 \quad y_1$

$$y - y_1 = m(x - x_1)$$

$$y - (6) = 3(x - (-3))$$

$$y - 6 = 3(x + 3)$$

$$y - 6 = 3x + 9$$

$$y - 6 + 6 = 3x + 9 + 6$$

$$y = 3x + 15$$

20) Find the equation of the line through the two points  $(-3, -4)$  and  $(-2, -6)$ .

$x_1 \quad y_1 \qquad x_2 \quad y_2$

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



$$y - (-4) = \frac{(-6) - (-4)}{(-2) - (-3)} (x - (-3))$$

$$y + 4 = \frac{-6 + 4}{-2 + 3} (x + 3)$$

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

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

$$y + 4 - 4 = -2x - 6 - 4$$

$$y = -2x - 10$$

21) Are lines parallel, perpendicular, or neither?

$$y = 6x - 8 \quad \text{Line 1}$$

$$y = -\frac{1}{6}x - 1 \quad \text{Line 2}$$

$$m_1 = 6 = \text{Slope of Line 1}$$

$$m_2 = -\frac{1}{6} = \text{Slope of Line 2}$$

$$m_2 = -\frac{1}{6} = -\frac{1}{m_1}$$

Lines are perpendicular

22. Are lines parallel, perpendicular, or neither?

$$y = 9x - 6 \quad \text{Line 1}$$

$$y = 9x + 4 \quad \text{Line 2}$$



$$m_1 = 9 = \text{slope of Line 1}$$

$$m_2 = 9 = \text{slope of Line 2}$$

$$m_1 = m_2 = 9 \quad \text{Slopes are equal}$$

So Lines are parallel

23. Are lines parallel, perpendicular, or neither?

$$y = 5x - 4 \quad \text{Line 1}$$

$$y = -5x - 8 \quad \text{Line 2}$$

$$m_1 = 5 = \text{slope of Line 1}$$

$$m_2 = -5 = \text{slope of Line 2}$$

$$m_1 \neq m_2 \quad \text{NOT Parallel}$$

$$m_1 \neq -\frac{1}{m_2} \quad \text{NOT Perpendicular}$$

Neither



24) Find the equation of the line perpendicular to  $y = 5x + 1$  through  $(0, -3)$ .

$m = -\frac{1}{5} =$  perpendicular slope.

41 ✓

$$y - y_1 = m(x - x_1)$$

$$y - (-3) = -\frac{1}{5}(x - (0))$$

$$y + 3 = -\frac{1}{5}(x - 0)$$

$$y + 3 = -\frac{1}{5}(x)$$

$$y + 3 = -\frac{1}{5}x$$

$$y + 3 - 3 = -\frac{1}{5}x - 3$$

$$y = -\frac{1}{5}x - 3$$

OR  
 $y = mx + b$

$$y = -\frac{1}{5}x - 3$$

$$5y = 5\left(-\frac{1}{5}x\right) - 5(3)$$

$$5y = -1x - 15$$

$$5y + 1x = -1x - 15 + 1x$$

$$5y + x = -15$$

$$x + 5y = -15$$

$$ax + by = c$$

25) Find the equation of the line parallel to  $y = -\frac{4}{5}x - 1$  through  $(0, 1)$ .

$m = -\frac{4}{5} =$  parallel slope

$$y - y_1 = m(x - x_1)$$

$$y - (1) = -\frac{4}{5}(x - (0))$$

$$y - 1 = -\frac{4}{5}(x - 0)$$

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

$$y - 1 = -\frac{4}{5}x$$

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

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

Form

$y = mx + b$

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

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

$$5y = -4x + 5$$

$$5y + 4x = -4x + 5 + 4x$$

$$5y + 4x = 5$$

$$4x + 5y = 5$$

Form

$$ax + by = c$$

26) Graph

$$y \leq -4x + 2$$

X	Y
0	2
1	-2

10. ✓

$$y = -4x + 2$$

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

$$y = 0 + 2$$

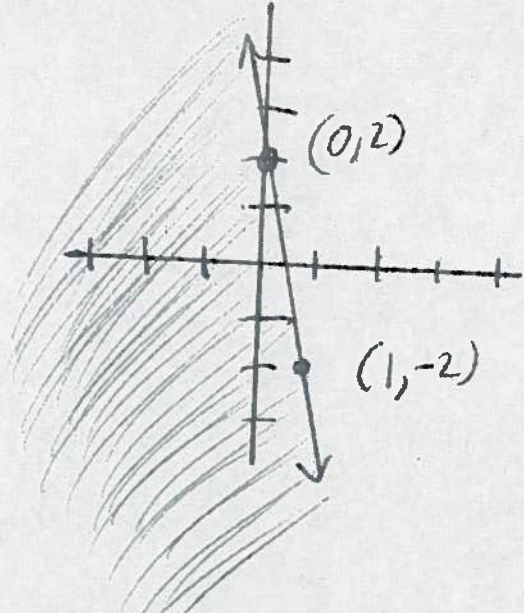
$$y = 2$$

$$y = -4x + 2$$

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

$$y = -4 + 2$$

$$y = -2$$



27) Is relation a function?

$$\{(-4, -8), (-3, -4), (+3, -1), (+5, -8)\}$$

YES this is a function.

28) Graph  $h(x) = -3x - 5$

X	h(x)
0	-5
1	-8

$$h(0) = -3(0) - 5$$

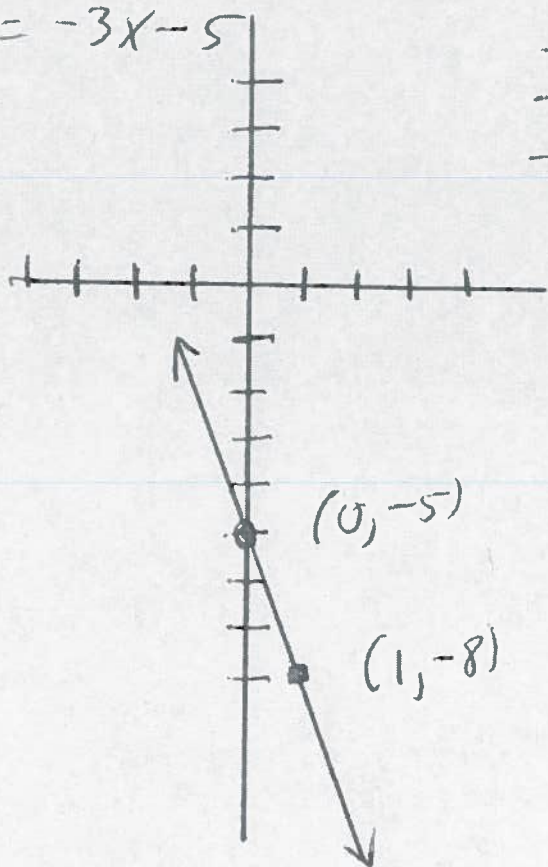
$$h(0) = 0 - 5$$

$$h(0) = -5$$

$$h(1) = -3(1) - 5$$

$$h(1) = -3 - 5$$

$$h(1) = -8$$



29) Graph  $f(x) = \frac{1}{2}x + 3$

$$f(0) = \frac{1}{2}(0) + 3$$

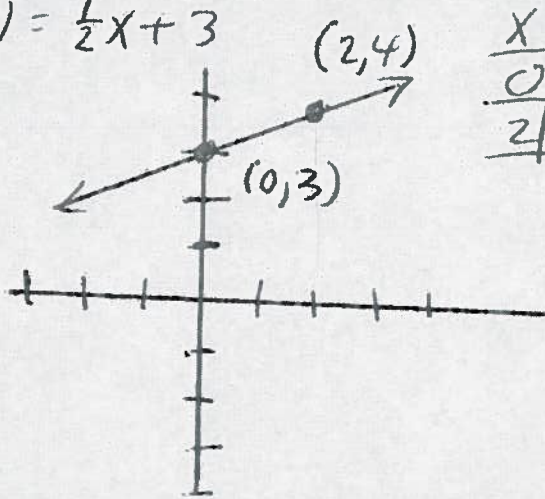
$$f(0) = 0 + 3$$

$$f(0) = 3$$

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

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

$$f(2) = 4$$



x	f(x)
0	3
2	4



30) Evaluate

$$g(x) = 3x$$

$$g(-3) = 3(-3)$$

$$g(-3) = -9$$

$(-3, -9)$

31) Evaluate

$$f(x) = -3x$$

$$f(n) = -3(n)$$

$$f(n) = -3n$$

$(n, -3n)$

32) Evaluate

$$g(x) = 8x + 3$$

$$g(a) = 8(a) + 3$$

$$g(a) = 8a + 3$$

$(a, 8a + 3)$

33) Evaluate

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

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

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

$$f(-4) = 5(16) - 16 + 2$$

$$\rightarrow f(-4) = 80 - 16 + 2$$

$$f(-4) = 64 + 2$$

$$f(-4) = 66$$

$(-4, 66)$

34

Evaluate

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

$$h(k) = 3(k)^2 + 4(k) + 5$$

$$h(k) = 3k^2 + 4k + 5$$

$$(k, 3k^2 + 4k + 5)$$

35

Evaluate

$$f(x) = |x + 4|$$

$$f(6) = |(6) + 4|$$

$$f(6) = |6 + 4|$$

$$f(6) = |10|$$

$$f(6) = (10)$$

$$f(6) = 10$$

$$(6, 10)$$

$$12$$

36

Evaluate

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

$$f(-9) = |(-9) - 7|$$

$$f(-9) = |-9 - 7|$$

$$f(-9) = |-16|$$

$$f(-9) = (16)$$

$$f(-9) = 16$$

$$(-9, 16)$$

37

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

$$h(-4) = \frac{(-4)^2 - 4}{(-4)}$$

Evaluate

$$h(-4) = \frac{(-4)(-4) - 4}{-4}$$

$$h(-4) = \frac{16 - 4}{-4}$$

$$h(-4) = \frac{12}{-4}$$

$$h(-4) = -3$$

$$(-4, -3)$$

38) Solve by graphing

$$x + y = 4 \rightarrow x + y - x = 4 - x$$

$$x - y = 2$$

$$y = 4 - x$$

$$y = -x + 4$$

$$x - y - x = 2 - x$$

$$-y = 2 - x$$

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

$$y = -2 + x$$

$$y = x - 2$$

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

$$y = 0 + 4$$

$$y = 4$$

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

$$y = -3 + 4$$

$$y = 1$$

X	Y
0	4
3	1

13 ✓

$$y = (0) - 2$$

$$y = 0 - 2$$

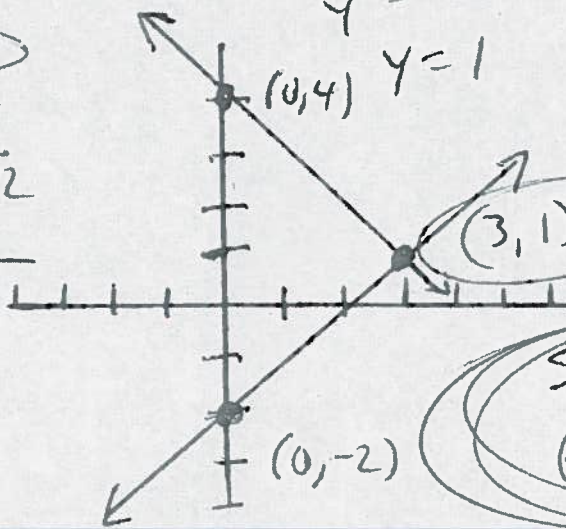
$$y = -2$$

$$y = (3) - 2$$

$$y = 3 - 2$$

$$y = 1$$

X	Y
0	-2
3	1



Solution

$$(x, y) = (3, 1)$$

39) Solve by substitution

$$x + y = 10$$

$$3x + 5y = 16$$

$$x + y - y = 10 - y$$

$$x = 10 - y$$

Sub

$$\rightarrow \frac{2y}{2} = \frac{-14}{2}$$

$$y = -7$$

Subst

$$x + y = 10$$

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

$$x - 7 = 10$$

$$x - 7 + 7 = 10 + 7$$

$$x = 17$$

$$(x, y) =$$

$$(17, -7)$$

$$3x + 5y = 16$$

$$3(10 - y) + 5y = 16$$

$$30 - 3y + 5y = 16$$

$$30 + 2y = 16$$

$$3x + 2y + 30 = 16 - 30$$

$$2y = -14$$

$$\textcircled{40} \quad \begin{aligned} 6x + 9y &= 2 \\ 3y &= -2x + 4 \end{aligned}$$

$$\begin{array}{r} 6x + 9y = 2 \\ 2x + 3y = 4 \end{array}$$

$$\begin{array}{r} (6x + 9y = 2) \cdot (-3) \\ (2x + 3y = 4) \cdot (9) \end{array}$$

$$-18x - 27y = -6$$

$$18x + 27y = 36$$

$$\hline 0 + 0 = 30$$

$$0 \neq 30$$

No solution

$\emptyset$

{ }

$\textcircled{14}$  ✓

$$\textcircled{41} \quad x - y = 7$$

$$x + y = 5$$

$$\hline 2x + 0 = 12$$

$$2x = 12$$

$$\frac{2x}{2} = \frac{12}{2}$$

$$\textcircled{x = 6}$$

subst

$$x - y = 7$$

$$(6) - y = 7$$

$$6 - y = 7$$

$$\cancel{6} - y - \cancel{6} = 7 - 6$$

$$-y = 1$$

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

$\textcircled{(x, y)}$   
 $\textcircled{(6, -1)}$

$$\textcircled{42} \quad 4x + 3y = 8$$

$$5x + 4y = 11$$

$$(4x + 3y = 8) \cdot (-4)$$

$$(5x + 4y = 11) \cdot 3$$

$$\hline -16x - 12y = -32$$

$$15x + 12y = 33$$

$$\hline -1x + 0 = 1$$

$$\textcircled{y = -1}$$

$$\rightarrow -1x = 1$$

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

$$\textcircled{x = -1}$$

Subst

$$4x + 3y = 8$$

$$4(-1) + 3y = 8$$

$$\rightarrow -4 + 3y = 8$$

$$-4 + 3y + 4 = 8 + 4$$

$$3y = 12$$

$$\frac{3y}{3} = \frac{12}{3}$$

$$\textcircled{y = 4}$$

$\textcircled{(x, y)}$

$\textcircled{(-1, 4)}$

43)  $5a^6 + 20a^4 =$  Factor GCF

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

15 ✓

44)  $x^2 + 7x + xy + 7y =$  Factor by grouping

$(x^2 + 7x) + (xy + 7y) =$

$x(x + 7) + y(x + 7) =$

$(x + 7)(x + y) =$

45)  $ty - 7y - 9t + 63 =$  Factor by grouping

$(ty - 7y) + (-9t + 63) =$

$y(t - 7) + 9(-t + 7) =$

$y(t - 7) - 9(t - 7) =$

$(t - 7)(y - 9) =$

46)  $121k^2 - 64m^2 =$

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

$(11k)^2 - (8m)^2 =$

$(11k + 8m)(11k - 8m) =$

47)  $2x^3 + 4x^2 - 16x =$  Factor

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

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

(48)  $Y^3 + 6Y^2 + 9Y =$  Factor

$$Y(Y^2 + 6Y + 9) =$$

$$Y(Y+3)(Y+3) =$$

$$Y(Y+3)^2 =$$

$$\begin{matrix} 9 \cdot 1 \\ 3 \cdot 3 \end{matrix}$$

16 ✓

(49)  $X^2 - 2X - 63 =$  Factor

$$(X+7)(X-9) =$$

$$\begin{matrix} 63 \cdot 1 \\ 7 \cdot 9 \\ 21 \cdot 3 \end{matrix}$$

(50)  $14y^2 + 63y - 35 =$  Factor

$$7(2y^2 + 9y - 5) =$$

$$7(2y-1)(y+5) =$$

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

$$\begin{matrix} 35 \cdot 1 \\ 7 \cdot 5 \end{matrix}$$

(51)  $(X-9)(X+6) = 0$  Solve

Set  $X-9=0$  OR  $X+6=0$

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

$$X=9 \text{ OR } X=-6$$

(52)  $24n^2 + 20n = 0$

$$4n(6n+5) = 0$$

Set  $4n=0$  OR  $6n+5=0$

$$\frac{4n}{4} = \frac{0}{4} \text{ OR } 6n+5-5=0-5$$

$$n=0 \text{ OR } 6n=-5$$
$$\frac{6n}{6} = \frac{-5}{6} \text{ OR } n = \frac{-5}{6}$$



$$\textcircled{53} \quad x^2 - x = 42$$

$$x^2 - x - 42 = 42 - 42$$

$$x^2 - x - 42 = 0$$

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

$$\text{Set } x+6=0 \text{ OR } x-7=0$$

$$x+6-6=0-6 \text{ OR } x-7+7=0+7$$

$$\textcircled{x=-6} \text{ OR } \textcircled{x=7}$$

$$\textcircled{54} \quad \frac{(y+3)(\cancel{y-4})}{(\cancel{y-4})(y+9)} = \text{Simpl. } \frac{y+3}{y+9} =$$

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

$$\textcircled{55} \quad \frac{5x-15}{x^2-9} = \text{Simplf} \quad a^2-b^2 = (a+b)(a-b)$$

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

$$\frac{5(\cancel{x-3})}{(x+3)(\cancel{x-3})} =$$

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

$\textcircled{17}$  ✓

$$(56) \frac{a^2 - 9b^2}{15ab^2} \cdot \frac{3a^2b}{a-3b} = \text{Simplify}$$

$$\frac{(a)^2 - (3b)^2}{15a^1b^2} \cdot \frac{3a^2b}{(a-3b)} =$$

$$\frac{(a+3b)(\cancel{a-3b})}{\cancel{15a^1}b^2} \cdot \frac{\cancel{3a^2}b}{(\cancel{a-3b})} =$$

$$\frac{(a+3b)}{5b} \cdot \frac{a}{1} =$$

$$\frac{a(a+3b)}{5b} =$$

$$\frac{a^2 + 3ab}{5b} =$$

$$(57) \frac{m^2 - 16}{m^2 + 4m - 32} \cdot \frac{m^2 - 4m - 32}{m-4} = \text{Simplify}$$

$$\frac{m^2 - 16}{m^2 + 4m - 32} \cdot \frac{(m-4)}{m^2 - 4m - 32} =$$

$$\frac{(\cancel{m+4})(m-4)}{(m-4)(m+8)} \cdot \frac{(\cancel{m-4})}{(\cancel{m+4})(m-8)} =$$

$$\frac{(m-4)}{(m+8)(m-8)} =$$

18.0 ✓

$$\textcircled{58} \quad \frac{3}{7x} + \frac{1}{2x} = -\frac{1}{14} \quad \text{LCD} = 14x$$

$$\frac{3}{7x}(14x) + \frac{1}{2x}(14x) = -\frac{1}{14}(14x)$$

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

$$6 + 7 = -1x$$

$$13 = -1x$$

$$\frac{13}{-1} = \frac{-1x}{-1}$$

$$\textcircled{-13 = x}$$

19 ✓

$$\textcircled{59} \quad \frac{2}{y+2} - \frac{5}{y-2} = \frac{10}{y^2-4}$$

$$\frac{2}{y+2} - \frac{5}{y-2} = \frac{10}{(y+2)(y-2)}$$

LCD  
(y+2)(y-2)

$$\frac{2}{\cancel{(y+2)}} \cancel{(y+2)}(y-2) - \frac{5}{\cancel{(y-2)}} \cancel{(y-2)}(y+2) = \frac{10}{\cancel{(y+2)}\cancel{(y-2)}} \cancel{(y+2)}\cancel{(y-2)}$$

$$2(y-2) - 5(y+2) = 10$$

$$2y - 4 - 5y - 10 = 10$$

$$-3y - 14 = 10$$

$$-3y - 14 + 14 = 10 + 14$$

$$-3y = 24$$

$$\frac{-3y}{-3} = \frac{24}{-3}$$

$$\textcircled{y = -8}$$

$$(60) \sqrt{75}$$

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

$$\sqrt{25} \sqrt{3} =$$

$$5\sqrt{3} =$$

$$\begin{array}{r} 3 \overline{) 75} \\ \underline{51} \phantom{0} \\ 24 \phantom{0} \\ \underline{24} \phantom{0} \\ 0 \phantom{0} \\ 1 \phantom{0} \end{array}$$

Simplify

20.0 ✓

$$(61) \sqrt{169x^6y^4z^8} =$$

Simplify

$$\sqrt{169x^6y^4z^8z^0} =$$

$$13x^3y^2\sqrt{z^0} =$$

$$(62) 8\sqrt{5} + 3\sqrt{20} =$$

$$8\sqrt{5} + 3\sqrt{4 \cdot 5} =$$

$$8\sqrt{5} + 3\sqrt{4}\sqrt{5} =$$

$$8\sqrt{5} + 3(2)\sqrt{5} =$$

$$8\sqrt{5} + 6\sqrt{5} =$$

$$14\sqrt{5} =$$

$$\begin{array}{r} 2 \overline{) 20} \\ \underline{20} \phantom{0} \\ 0 \phantom{0} \\ 1 \phantom{0} \end{array}$$

Simplify

$$(63) \sqrt{3x^3} \sqrt{6x^2} =$$

Simplify

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

$$\sqrt{18x^5} =$$

$$\sqrt{9 \cdot 2x^4x^1} =$$

$$3x^2\sqrt{2x^1} =$$

$$\begin{array}{r} 2 \overline{) 18} \\ \underline{36} \phantom{0} \\ 0 \phantom{0} \\ 3 \phantom{0} \end{array}$$

64)  $\frac{2}{8-\sqrt{3}}$  Rationalize the denominator

$$\left(\frac{2}{8-\sqrt{3}}\right)\left(\frac{8+\sqrt{3}}{8+\sqrt{3}}\right) =$$

$$\frac{16 + 2\sqrt{3}}{64 + 8\sqrt{3} - 8\sqrt{3} - (\sqrt{3})^2} =$$

$$\frac{16 + 2\sqrt{3}}{64 - (\sqrt{3})^2} =$$

$$\frac{16 + 2\sqrt{3}}{64 - 3} =$$

$$\frac{16 + 2\sqrt{3}}{61} =$$

21 ✓

65)  $\frac{\sqrt{7}}{\sqrt{7}-\sqrt{2}}$  Rationalize the denominator

$$\left(\frac{\sqrt{7}}{\sqrt{7}-\sqrt{2}}\right)\left(\frac{\sqrt{7}+\sqrt{2}}{\sqrt{7}+\sqrt{2}}\right) =$$

$$\frac{(\sqrt{7})^2 + \sqrt{7}\sqrt{2}}{(\sqrt{7})^2 + \sqrt{7}\sqrt{2} - \sqrt{7}\sqrt{2} - (\sqrt{2})^2} =$$

$$\frac{7 + \sqrt{7}\sqrt{2}}{(\sqrt{7})^2 - (\sqrt{2})^2} =$$

$$\frac{7 + \sqrt{14}}{7 - 2} =$$

$$\frac{7 + \sqrt{14}}{5} =$$

$$\textcircled{66} \sqrt{x+3} = 3$$
$$(\sqrt{x+3})^2 = (3)^2$$

$$x+3 = 9$$

$$x+3-3 = 9-3$$

$$\textcircled{x=6}$$

Solve

~~22~~

$$\textcircled{67} \sqrt{7-x} = x-1 \quad \text{Solve}$$

$$(\sqrt{7-x})^2 = (x-1)^2$$

$$7-x = (x-1)(x-1)$$

$$7-x = x^2 - 1x - 1x + 1$$

$$7-x = x^2 - 2x + 1$$

$$0 = x^2 - 2x + 1 - 7 + x$$

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

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

$$\text{Set } x+2=0 \quad \text{OR} \quad x-3=0$$

$$x+2-2=0-2 \quad \text{OR} \quad x-3+3=0+3$$

$$\textcircled{x=-2}$$

OR

$$\textcircled{x=3}$$

$\{3\}$

~~CK~~ BAD

Good

$$\sqrt{7-(-2)} = (-2)-1$$

$$\sqrt{7+2} = -2-1$$

$$\sqrt{9} = -3$$

$$3 \neq -3$$

BAD

CK

$$\sqrt{7-(3)} = (3)-1$$

$$\sqrt{7-3} = 2$$

$$\sqrt{4} = 2$$

$$2 = 2$$

Good

68) Find distance  $(5, -2)$  and  $(2, 2)$   
 $x_1 \quad y_1 \quad x_2 \quad y_2$

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

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

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

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

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

$$d = \sqrt{25}$$

$$= 5$$

23 ✓

69) Find distance  $(10, 0)$  and  $(0, -11)$   
 $x_1 \quad y_1 \quad x_2 \quad y_2$

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

$$d = \sqrt{(10 - 0)^2 + (0 - (-11))^2}$$

$$d = \sqrt{(10 - 0)^2 + (0 + 11)^2}$$

$$d = \sqrt{(10)^2 + (11)^2}$$

$$d = \sqrt{100 + 121}$$

$$d = \sqrt{221}$$

(70)  $\sqrt[3]{1000} =$  Simplify

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

$10 =$

(71)  $\sqrt[4]{48 \times 28} =$

$\sqrt[4]{16 \cdot 3 \cdot 28} =$

$2 \times \sqrt[4]{3} =$

Simplify

2	48
2	24
2	12
2	6
3	3
	1

24 ✓

(72)  $\sqrt[3]{-27a^{11}b^{13}} =$  Simplify

$\sqrt[3]{(-3)^3 a^9 b^{12} b^1} =$

$(-3) a^3 b^4 \sqrt[3]{a^2 b^1} =$

(73)  $\sqrt[3]{81} + 4\sqrt[3]{3} - \sqrt[3]{24}$   
 $\sqrt[3]{27 \cdot 3} + 4\sqrt[3]{3} - \sqrt[3]{8 \cdot 3}$   
 $3\sqrt[3]{3} + 4\sqrt[3]{3} - 2\sqrt[3]{3} =$

$7\sqrt[3]{3} - 2\sqrt[3]{3} =$

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

3	81
3	27
3	9
3	3
	1

2	24
2	12
2	6
3	3
	1



$$(74) \quad 100^{\frac{1}{2}} =$$

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

$$10^{\frac{2}{2}} =$$

$$10^1 =$$

$$10 =$$

$$\text{OR } \sqrt{100} = 10$$

(251) ✓

$$(75) \quad \sqrt[3]{x+3} = 4$$

$$(\sqrt[3]{x+3})^3 = (4)^3$$

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

$$x+3 = 64$$

$$x+3-3 = 64-3$$

$$x = 61$$

(76.) Determine whether the relation represents a function

$$\{(1, 9), (-1, -8), (-6, -5), (6, -8)\}$$

YES a function

$$\text{Domain} = D = \{-6, -1, 1, 6\}$$

$$\text{Range} = R = \{-8, -5, 9\}$$

Determine whether the relation represents a function

77.  $\{(2, 9), (-2, -9), (-2, -4), (6, -9)\}$

26 ✓

Not a function since  $(-2, -9)$  and  $(-2, -4)$

OR  $f(-2) = -9$  and  $f(-2) = -4$

78.  $f(x) = 2x + 4$  find  $f(-5)$

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

$$f(-5) = -10 + 4$$

$$f(-5) = -6$$

$$(-5, -6)$$

79.  $h(x) = 3x^2 - 7x - 4$  find  $h(-5)$

$$h(-5) = 3(-5)^2 - 7(-5) - 4$$

$$h(-5) = 3(-5)(-5) - 7(-5) - 4$$

$$h(-5) = 3(25) - 7(-5) - 4$$

$$h(-5) = 75 + 35 - 4$$

$$h(-5) = 110 - 4$$

$$h(-5) = 106$$

$$(-5, 106)$$

80.  $f(x) = |5x - 4|$  find  $f(-3)$

$$f(-3) = |5(-3) - 4|$$

$$f(-3) = |-15 - 4|$$

$$f(-3) = |-19|$$

$$f(-3) = 19 \text{ OR}$$

$$(-3, 19)$$

27 ✓

81.  $g(x) = -x^2 - 4x + 9$

$$g(t) = -(t)^2 - 4(t) + 9$$

$$g(t) = -t^2 - 4t + 9 \text{ OR}$$

$$(t, -t^2 - 4t + 9)$$

82.  $f(x) = -8x + 3$  find  $f(x-4)$

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

$$f(x-4) = -8x + 32 + 3$$

$$f(x-4) = -8x + 35 \text{ OR}$$

$$(x-4, -8x + 35)$$

83.  $g(x) = 2x^2 - 5x - 3$  find  $g(x-1)$

$$g(x-1) = 2(x-1)^2 - 5(x-1) - 3$$

$$g(x-1) = 2(x-1)(x-1) - 5(x-1) - 3$$

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

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

$$g(x-1) = 2x^2 - 4x + 2 - 5x + 5 - 3$$

$$g(x-1) = 2x^2 - 9x + 4 \text{ OR}$$

$$(x-1, 2x^2 - 9x + 4)$$

84.  $f(x) = x^2 + 6$  find  $f(a+h)$

$$f(a+h) = (a+h)^2 + 6$$

$$f(a+h) = (a+h)(a+h) + 6$$

$$f(a+h) = a^2 + ah + ah + h^2 + 6$$

$$f(a+h) = a^2 + 2ah + h^2 + 6 \quad \text{OR} \quad (a+h, a^2 + 2ah + h^2 + 6)$$

28 ✓

85.  $f(x) = 8x + 8$

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

$$\frac{(8(a+h) + 8) - (8a + 8)}{h} =$$

$$\frac{8a + 8h + 8 - 8a - 8}{h} =$$

$$\frac{8h}{h} =$$

$$8 =$$

86.  $f(x) = 7x^2$   $\frac{f(a+h) - f(a)}{h}$

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

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

$$\frac{7(a^2 + ah + ah + h^2) - 7a^2}{h} =$$

$$\frac{7(a^2 + 2ah + h^2) - 7a^2}{h} =$$

$$\frac{7a^2 + 14ah + 7h^2 - 7a^2}{h} =$$

$$\frac{14ah + 7h^2}{h} =$$

$$14a + 7h =$$

87) Let  $f(x) = 6 - 2x$  and  $g(x) = -8x + 2$

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

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

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

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

$-10x + 8 =$  and Domain =  $D = (-\infty, \infty)$

29 ✓

88) Let  $f(x) = 2x^2 - 3$  and  $g(x) = 7x - 4$

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

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

$(2x^2 - 3) - (7x - 4) =$

$2x^2 - 3 - 7x + 4 =$

$2x^2 - 7x + 1 =$  and Domain =  $D = (-\infty, \infty)$

89) Let  $f(x) = 5x + 1$  and  $g(x) = 2x - 5$

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

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

$\frac{5x+1}{2x-5} =$

Domain =  $D = \{x \mid x \neq \frac{5}{2}\}$

OR

Domain =  $(-\infty, \frac{5}{2}) \cup (\frac{5}{2}, \infty)$

Find domain  $2x - 5 = 0$

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

$2x = 5$

$\frac{2x}{2} = \frac{5}{2}$

$x = \frac{5}{2}$

90. Let  $f(x) = 5x^2 - 2$  and  $g(x) = 4x + 1$

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

$f(g(x)) =$

$(5x^2 - 2)(4x + 1) =$

$20x^3 + 5x^2 - 8x - 2 =$

and Domain =  $D = (-\infty, \infty)$

30

91. Let  $f(x) = 7x + 15$  and  $g(x) = 4x - 1$

Find  $(f \circ g)(a) =$

$f(g(a)) =$

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

$f(4a - 1) =$

$7(4a - 1) + 15 =$

$28a - 7 + 15 =$

$28a + 8 =$

and Domain =  $D = (-\infty, \infty)$

92. Let  $f(x) = 4x^2 + 3x + 8$  and  $g(x) = 3x - 5$

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

$g(f(x)) =$

$g(4x^2 + 3x + 8) =$

$3(4x^2 + 3x + 8) - 5 =$

$12x^2 + 9x + 24 - 5 =$

$12x^2 + 9x + 19 =$

and Domain =  $D = (-\infty, \infty)$

93)  $f(t) = \sqrt{t-5}$  and  $g(t) = 4t+8$

Find  $(f \circ g)(t)$

$$f(g(t)) =$$

$$f(4t+8) =$$

$$\sqrt{(4t+8)-5} =$$

$$\sqrt{4t+8-5} =$$

$$\sqrt{4t+3} =$$

and Domain =  $D = \left[-\frac{3}{4}, \infty\right)$

$$4t+3 \geq 0$$

$$4t+3-3 \geq 0-3$$

$$4t \geq -3$$

$$\frac{4t}{4} \geq \frac{-3}{4}$$

$$t \geq -\frac{3}{4}$$

31.

94. Let  $f(x) = -2x+2$  and  $g(x) = 3x^2+2x+7$

$$(g \circ f)(6) =$$

$$g(f(6)) =$$

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

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

$$g(-10) =$$

$$3(-10)^2 + 2(-10) + 7 =$$

$$3(-10)(-10) + 2(-10) + 7 =$$

$$3(100) + 2(-10) + 7 =$$

$$300 - 20 + 7 =$$

$$280 + 7 =$$

$$287 =$$

95. Graph  $f(x) = 5$

$$f(0) = 5$$

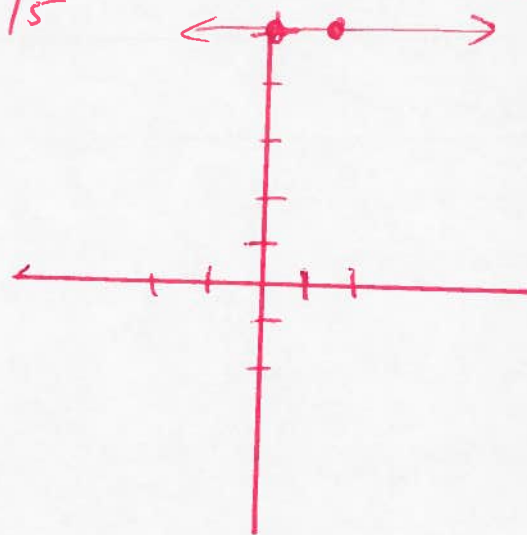
$$f(1) = 5$$

$$D = (-\infty, \infty)$$
$$R = \{5\}$$

X	f(x)
0	5
1	5

(0, 5) (1, 5)

32



96. Graph

$$g(x) = x - 4$$

$$g(0) = (0) - 4$$

$$g(0) = 0 - 4$$

$$g(0) = -4$$

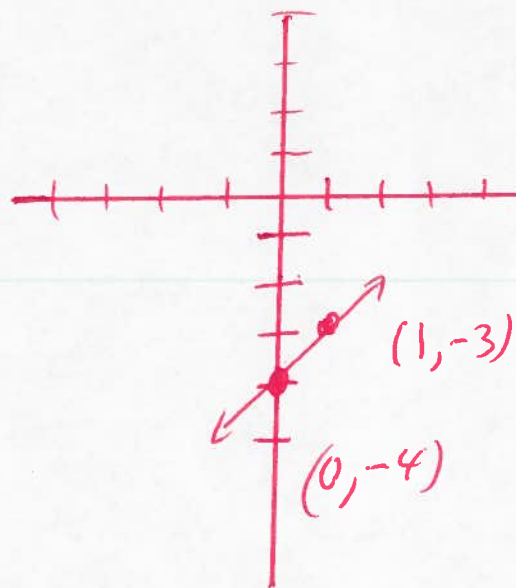
$$D = (-\infty, \infty)$$
$$R = (-\infty, \infty)$$

X	g(x)
0	-4
1	-3

$$g(1) = (1) - 4$$

$$g(1) = 1 - 4$$

$$g(1) = -3$$





97

Graph  
 $h(x) = x^2 - 2$

$D = (-\infty, \infty)$   
 $R = [-2, \infty)$

x	h(x)
-1	-1
0	-2
1	-1

33

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

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

$h(-1) = 1 - 2$

$h(-1) = -1$

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

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

$h(0) = 0 - 2$

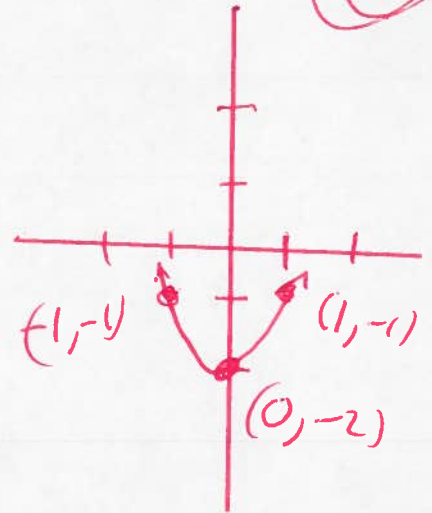
$h(0) = -2$

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

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

$h(1) = 1 - 2$

$h(1) = -1$



98

Graph  
 $f(x) = |x - 9|$

x	f(x)
8	1
9	0
10	1

$f(8) = |8 - 9|$

$f(8) = |-1|$

$f(8) = 1$

$f(9) = |9 - 9|$

$f(9) = |0|$

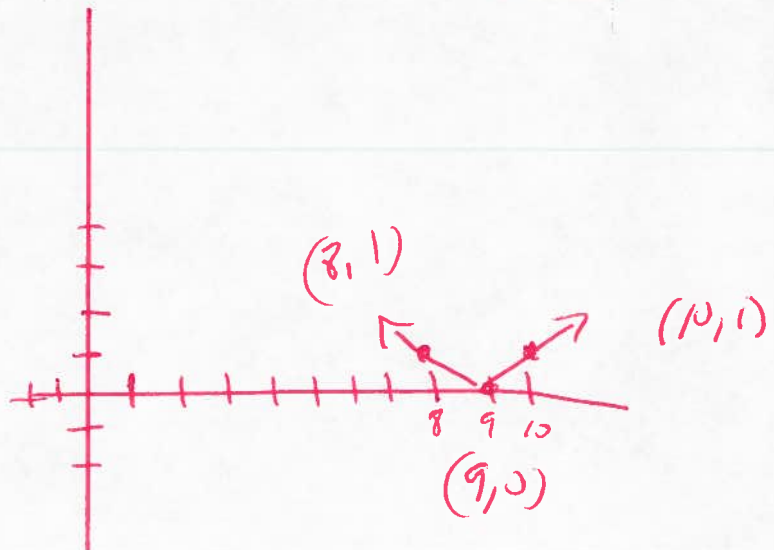
$f(9) = 0$

$f(10) = |10 - 9|$

$f(10) = |1|$

$f(10) = 1$

$D = (-\infty, \infty)$   
 $R = [0, \infty)$

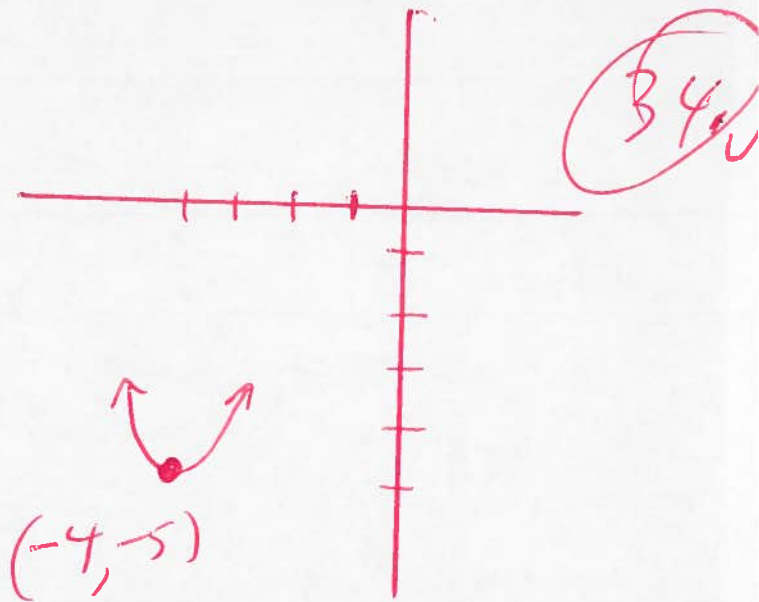


99) Graph

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

$$\text{Vertex} = (-4, -5)$$

Opens up

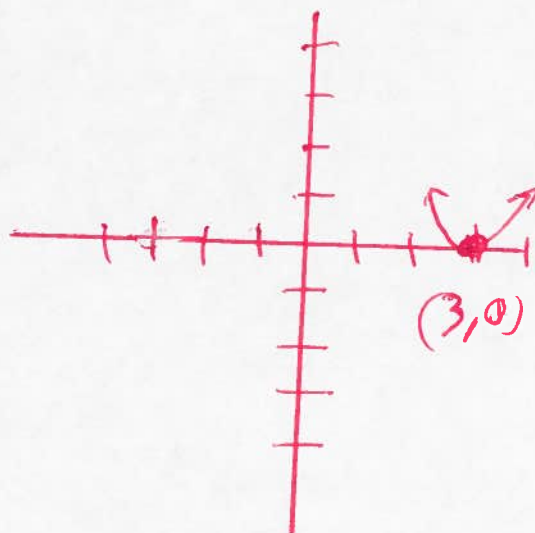


100) Graph

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

$$\text{Vertex} = (3, 0)$$

Opens up



101) Graph

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

$$f(-4) = |-4+3|$$

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

$$f(-4) = 1$$

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

$$f(-3) = |0|$$

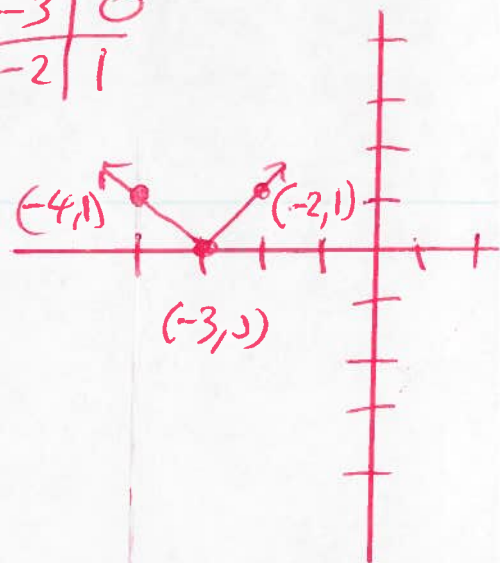
$$f(-3) = 0$$

$$f(-2) = |-2+3|$$

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

$$f(-2) = 1$$

x	f(x)
-4	1
-3	0
-2	1



102. Graph

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

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

$$f(-2) = \sqrt{0} - 7$$

$$f(-2) = 0 - 7$$

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

$$f(-1) = \sqrt{-1+2} - 7$$

$$f(-1) = \sqrt{1} - 7$$

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

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

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

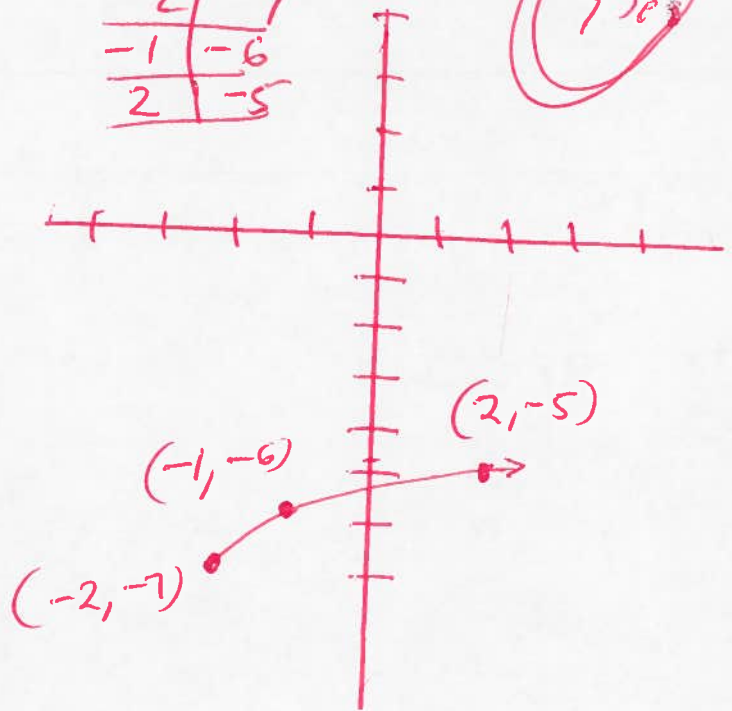
$$f(2) = \sqrt{4} - 7$$

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

$$f(2) = -5$$

x	f(x)
-2	-7
-1	-6
2	-5

350 ✓



103. Graph  $g(x) = -|x| - 3$

$$g(-1) = -|-1| - 3$$

$$g(-1) = -(1) - 3$$

$$g(-1) = -1 - 3$$

$$g(-1) = -4$$

$$g(0) = -|0| - 3$$

$$g(0) = -(0) - 3$$

$$g(0) = 0 - 3$$

$$g(0) = -3$$

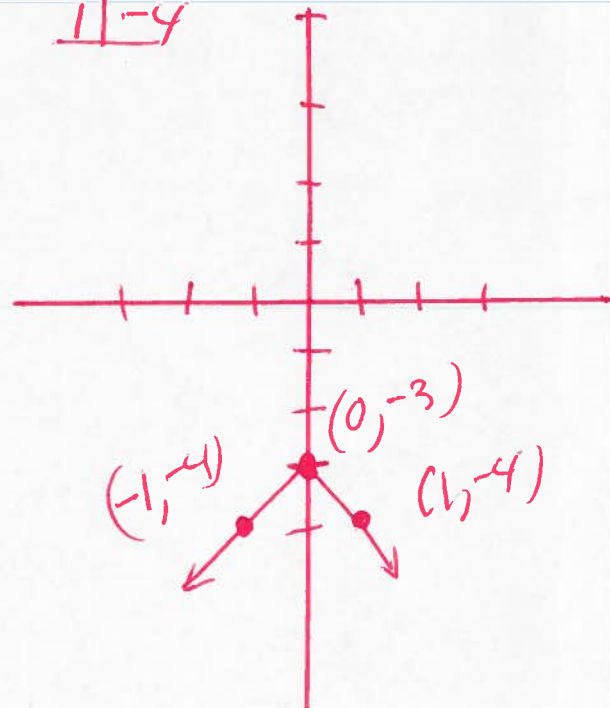
$$g(1) = -|1| - 3$$

$$g(1) = -(1) - 3$$

$$g(1) = -1 - 3$$

$$g(1) = -4$$

x	g(x)
-1	-4
0	-3
1	-4



104 Graph

$$g(x) = 7 - |x - 4|$$

$$g(3) = 7 - |3 - 4|$$

$$g(3) = 7 - |-1|$$

$$g(3) = 7 - (1)$$

$$g(3) = 7 - 1$$

$$g(3) = 6$$

$$g(4) = 7 - |4 - 4|$$

$$g(4) = 7 - |0|$$

$$g(4) = 7 - (0)$$

$$g(4) = 7 - 0$$

$$g(4) = 7$$

$$g(5) = 7 - |5 - 4|$$

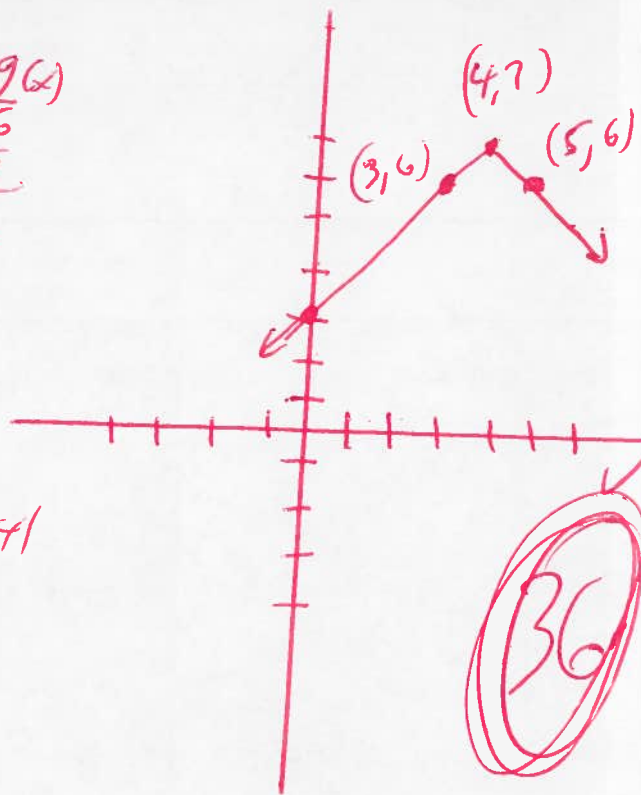
$$g(5) = 7 - |1|$$

$$g(5) = 7 - (1)$$

$$g(5) = 7 - 1$$

$$g(5) = 6$$

x	g(x)
3	6
4	7
5	6



105.  $(-7 - 8i) + (13 + 5i) =$

$$-7 - 8i + 13 + 5i =$$

$$6 - 3i =$$

106.  $(4 - 8i)(9 + 3i) =$

$$36 + 12i - 72i - 24i^2 =$$

$$36 - 60i - 24i^2 =$$

$$36 - 60i - 24(-1) =$$

$$36 - 60i + 24 =$$

$$60 - 60i =$$

$$(107) \frac{5-i}{-9+4i} =$$

$$\left( \frac{5-i}{-9+4i} \right) \left( \frac{-9-4i}{-9-4i} \right) =$$

$$\frac{-45 - 20i + 9i + 4i^2}{81 + 36i - 36i - 16i^2} =$$

$$\frac{-45 - 29i + 4i^2}{81 - 16i^2} =$$

$$\frac{-45 - 29i + 4(-1)}{81 - 16(-1)} =$$

$$\frac{-45 - 29i - 4}{81 + 16} =$$

$$\frac{-49 - 29i}{97} =$$

$$\frac{-49 - 29i}{97} =$$

37.

$$\frac{-49}{97} - \frac{29i}{97} =$$

(108) Solve

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

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

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

$x=3$

OR  $8x=3$

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

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

109 Solve by factoring

$$7x^2 + 19x - 6 = 0$$

$$(7x - 2)(x + 3) = 0$$

Set  $7x - 2 = 0$  OR  $x + 3 = 0$

$$7x - 2 + 2 = 0 + 2 \quad \text{OR} \quad x + 3 - 3 = 0 - 3$$

$$7x = 2$$

$$\frac{7x}{7} = \frac{2}{7}$$

$$x = \frac{2}{7}$$

OR  $x = -3$

7.1      6.1  
2.3

38

110 Solve by square root property

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

$$\sqrt{(x - 6)^2} = \pm \sqrt{16}$$

$$x - 6 = \pm 4$$

$$x - 6 = -4 \quad \text{OR} \quad x - 6 = 4$$

$$x - 6 + 6 = -4 + 6 \quad \text{OR} \quad x - 6 + 6 = 4 + 6$$

$$x = 2$$

OR  $x = 10$

111 Solve by completing the square

$$x^2 - 12x + 32 = 0$$

$$x^2 - 12x = -32$$

$$x^2 - 12x + \left(\frac{1}{2}(-12)\right)^2 = -32 + \left(\frac{1}{2}(-12)\right)^2$$

$$x^2 - 12x + (-6)^2 = -32 + (-6)^2$$

$$x^2 - 12x + 36 = -32 + 36$$

$$x^2 - 12x + 36 = 4$$

$$(x - 6)(x - 6) = 4$$

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

$$\sqrt{(x - 6)^2} = \pm \sqrt{4}$$

$$x - 6 = \pm 2$$

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

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

$$x = 4$$

OR  $x = 8$

(112) Solve by completing the square

$$x^2 - 6x + 18 = 0$$

$$x^2 - 6x = -18$$

$$x^2 - 6x + \left(\frac{1}{2}(-6)\right)^2 = -18 + \left(\frac{1}{2}(-6)\right)^2$$

$$x^2 - 6x + (-3)^2 = -18 + (-3)^2$$

$$x^2 - 6x + 9 = -18 + 9$$

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

$$(x-3)(x-3) = -9$$

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

$$\sqrt{(x-3)^2} = \pm\sqrt{-9}$$

$$x-3 = \pm 3i$$

$$x-3 = -3i \quad \text{OR} \quad x-3 = 3i$$

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

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

$$x = 3-3i$$

$$\text{OR } x = 3+3i$$

39

(113) Solve by the Quadratic formula

$$5x^2 + 8x = 4$$

$$5x^2 + 8x - 4 = 0$$

$$a=5, b=8, c=-4$$

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

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(5)(-4)}}{2(5)}$$

$$x = \frac{-8 \pm \sqrt{64 + 80}}{10}$$

$$x = \frac{-8 \pm \sqrt{144}}{10}$$

$$x = \frac{-8 \pm 12}{10}$$

$$x = \frac{-8 - 12}{10} \quad \text{OR} \quad x = \frac{-8 + 12}{10}$$

$$x = \frac{-20}{10} \quad \text{OR} \quad x = \frac{4}{10}$$

$$x = -2$$

$$\text{OR} \quad x = \frac{2}{5}$$

40.



114 Solve by the Quadratic formula

$$4x^2 - 3x + 1 = 0$$

$$a=4, b=-3, c=1$$

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

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

$$x = \frac{3 \pm \sqrt{9 - 16}}{8}$$

$$x = \frac{3 \pm \sqrt{-7}}{8}$$

$$x = \frac{3 \pm \sqrt{7}i}{8}$$

$$x = \frac{3 - \sqrt{7}i}{8} \quad \text{OR} \quad x = \frac{3 + \sqrt{7}i}{8}$$

$$x = \frac{3}{8} - \frac{\sqrt{7}}{8}i \quad \text{OR}$$

$$x = \frac{3}{8} + \frac{\sqrt{7}}{8}i$$

115 Solve

$$x^4 + 12x^2 - 64 = 0$$

$$(x^2 - 4)(x^2 + 16) = 0$$

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

$$x+2=0 \quad \text{OR} \quad x-2=0 \quad \text{OR} \quad x^2+16=0$$

$$x+2-2=0-2 \quad \text{OR} \quad x-2+2=0+2 \quad \text{OR} \quad x^2=-16$$

$$x=-2 \quad \text{OR} \quad x=2 \quad \text{OR} \quad \sqrt{x^2} = \pm\sqrt{16}$$

$$x=-2 \quad \text{OR} \quad x=2 \quad \text{OR} \quad x = \pm 4i$$

116  $(4x-4)^2 - 6(4x-4) - 7 = 0$

Let  $m = 4x-4$

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

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

$(42)$  ✓

$m+1=0$  OR  $m-7=0$

$m+1-1=0-1$  OR  $m-7+7=0+7$

$m=-1$  OR  $m=7$

$4x-4=-1$  OR  $4x-4=7$

$4x-4+4=-1+4$  OR  $4x-4+4=7+4$

$4x=3$  OR  $4x=11$

$\frac{4x}{4} = \frac{3}{4}$  OR  $\frac{4x}{4} = \frac{11}{4}$

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

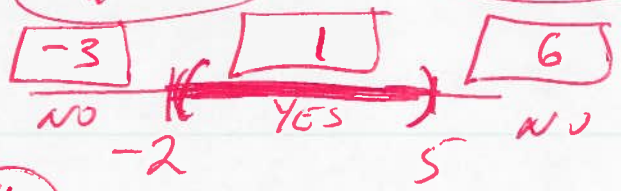
OR  $x = \frac{11}{4}$

117) solve

$(x+2)(x-5) < 0$

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

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



ck  $x=1$

$(1+2)(1-5) < 0$

$(3)(-4) < 0$

$-12 < 0$  ✓

ck  $x=6$

$(6+2)(6-5) < 0$  ?

$(8)(1) < 0$  ?

$8 < 0$  NO

ck  $x=-3$   $(-3+2)(-3-5) < 0$  ?

$(-1)(-8) < 0$  ?

$8 < 0$  NO

$(-2, 5)$

118

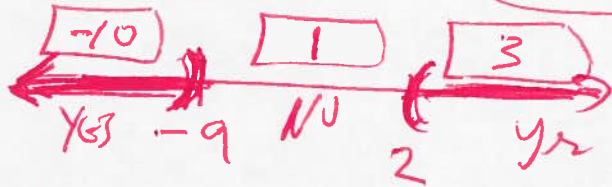
Solve

$$\frac{x-2}{x+9} > 0$$

Set  $x-2=0$  OR  $x+9=0$

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

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



ck

$x=-10$

$$\frac{-10-2}{-10+9} > 0 ?$$

$$\frac{-12}{-1} > 0 ?$$

$$12 > 0 \text{ Yes}$$

ck

$x=3$

$$\frac{3-2}{3+9} > 0$$

$$\frac{1}{12} > 0 \text{ Yes}$$

ck

$x=1$

$$\frac{1-2}{1+9} > 0 ?$$

$$\frac{-1}{10} > 0 \text{ NO}$$

$x < -9$  OR  $x > 2$

$(-\infty, -9) \cup (2, \infty)$

43