

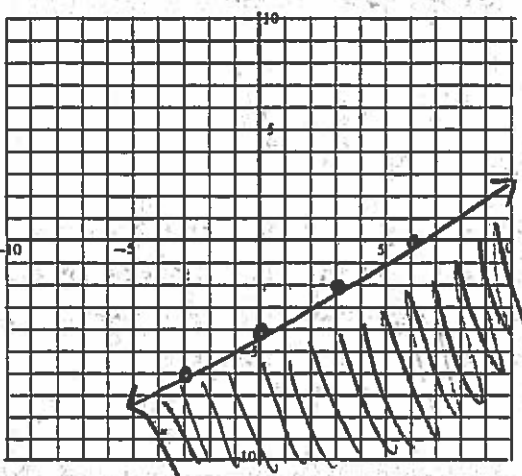
Name: Answers

Date: \_\_\_\_\_

1. Graph each inequality.

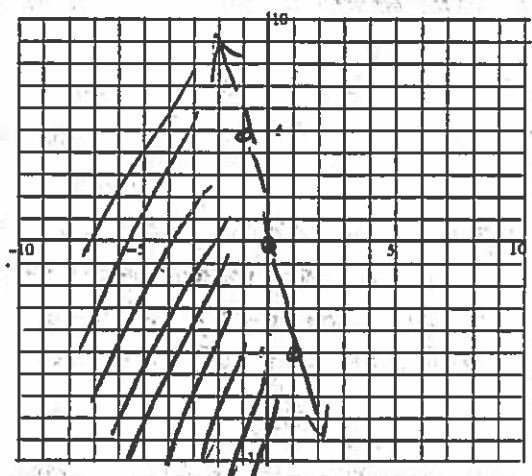
a)  $2x - 3y \geq 12$        $-3y \geq -2x + 12$   
 $y \leq \frac{2}{3}x - 4$

Test point  
(0,0)  
LHS  
 $2(0) - 3(0)$   
0  
RHS 12  
 $0 \geq 12$   
(not true)



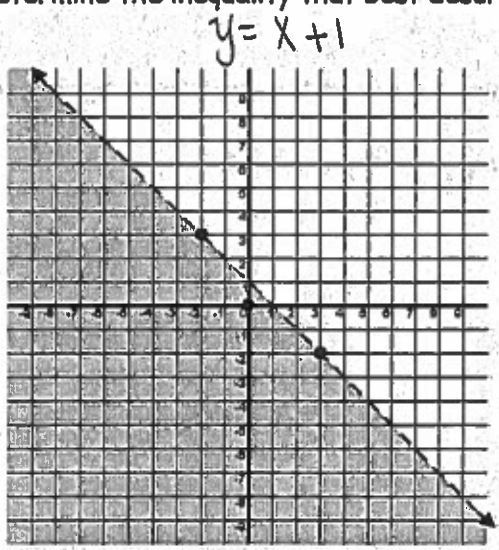
b)  $-5x - y > 0$        $-y > 5x$   
 $y < -5x$

Test  
(1,0)  
LHS  
 $-5(1) - 0$   
-5  
RHS 0  
 $-5 > 0$   
(not true)



2. Determine the inequality that best describes each graph.

Test  
(0,0) a)  
LHS 0  
RHS 0+1  
1  
 $0 < 1$

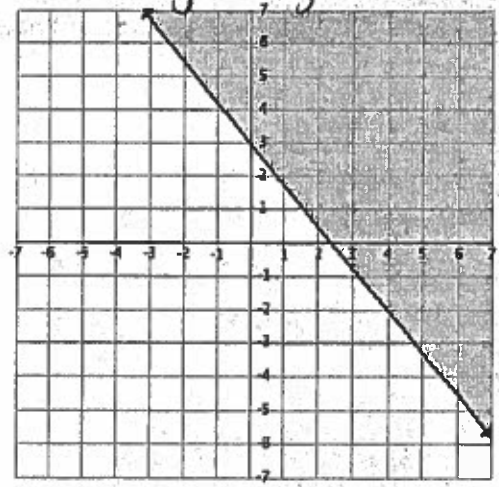


$\therefore y < x + 1$

b)

$y = -\frac{4}{3}x + 3$

Test  
(3,1)  
LHS 1  
RHS  $-\frac{4}{3}(3) + 3$   
 $-4 + 3$   
-1  
 $1 \geq -1$



$\therefore y \geq -\frac{4}{3}x + 3$

3. Algebraically solve  $2x^2 + 9x - 5 \leq 0$ .

$2x^2 + 9x - 5 = 0$       p-10      59  
 $2x^2 + 10x - x - 5 = 0$       10, -1

$2x(x+5) - 1(x+5) = 0$

$(2x-1)(x+5) = 0$

$x = \frac{1}{2}$        $x = -5$



$\{x \mid -5 \leq x \leq 0.5, x \in \mathbb{R}\}$

Verify

$x = \frac{1}{2}$   
LHS  $2(\frac{1}{2})^2 + 9(\frac{1}{2}) - 5$   
 $= 2(\frac{1}{4}) + \frac{9}{2} - 5$   
 $= \frac{1}{2} + \frac{9}{2} - 5 \leq 0$   
 $= 0 \leq 0$  ✓

$x = -5$   
LHS  $2(-5)^2 + 9(-5) - 5$   
 $2(25) - 45 - 5$   
 $50 - 45 - 5$   
 $5 - 5$   
 $0 \leq 0$  ✓  
 true.

2.  $y = -16x^2 + 177x + 4$   
 $y = 65x + 100$

$$65x + 100 = -16x^2 + 177x + 4$$

$$16x^2 - 112x + 96 = 0$$

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

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

$$x = 6 \quad x = 1$$

$$x = 6$$

$$y = 65(6) + 100$$

$$y = 390 + 100$$

$$y = 490$$

$$(6, 490)$$

$$x = 1$$

$$y = 65(1) + 100$$

$$y = 65 + 100$$

$$y = 165$$

$$(1, 165)$$

verify

$$(6, 490) \quad \checkmark$$

LHS  
490

RHS

$$-16(6)^2 + 177(6) + 4$$

$$-576 + 1062 + 4$$

$$490$$

$$(1, 165) \quad \checkmark$$

LHS  
165

RHS

$$-16(1)^2 + 177(1) + 4$$

$$-16 + 177 + 4$$

$$165$$

$$3. a) (3x - y = -5) (-1)$$

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

$$y - 3x = 5$$

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

$$x^2 - x = 6$$

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

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

$$x = 3 \quad x = -2$$

$$x = 3$$

$$3x - y = -5$$

$$(3)(3) - y = -5$$

$$-y = -5 - 9$$

$$-y = -14$$

$$y = 14$$

$$(3, 14)$$

$$x = -2$$

$$3x - y = -5$$

$$3(-2) - y = -5$$

$$-y = -5 + 6$$

$$-y = 1$$

$$y = -1$$

$$(-2, -1)$$

$$b) 4x^2 - y + 8x = -2$$

$$y + 2 = 4x^2 - 8x$$

$$4x^2 - y + 8x = -2$$

$$4x^2 - 8x - y - 2 = 0$$

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

$$4x^2 - y - 8x = 2$$

$$-4x^2 + y - 8x = 2$$

$$4x^2 - y - 8x = 2$$

$$\frac{-16x}{-16} = \frac{4}{-16}$$

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

$$\left(-\frac{1}{4}, \frac{1}{4}\right)$$

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

$$y + 2 = 4\left(\frac{1}{4}\right)^2 - 8\left(\frac{1}{4}\right)$$

$$y + 2 = \frac{9}{4}$$

$$y = \frac{9}{4} - 2$$

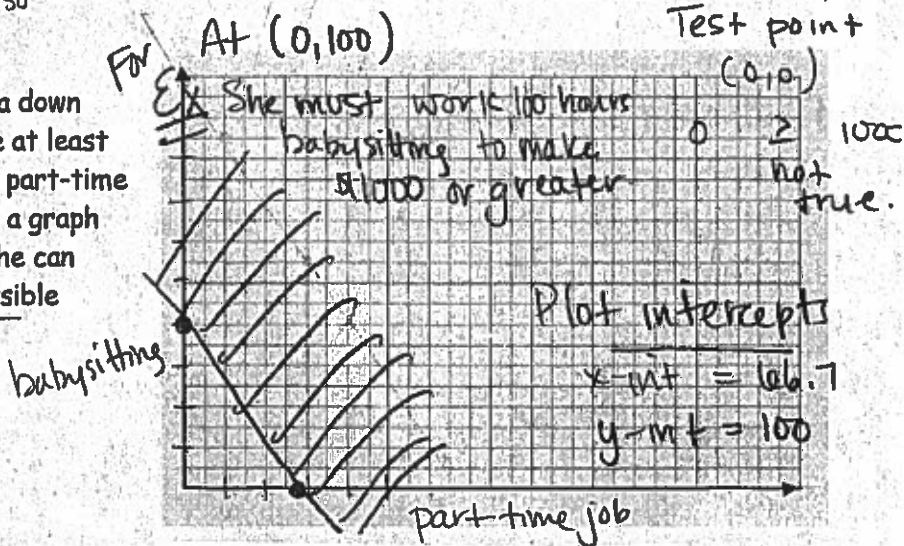
$$y = \frac{1}{4}$$

4. Amber is working to earn money for a down payment on a car. She wants to save at least \$1000. Amber makes \$15/hour at a part-time job and \$10/hour babysitting. Draw a graph to show some of the possible ways she can work to earn money. Choose one possible solution and state what it means.

$$15x + 10y \geq 1000$$

$$10y \geq -15x + 1000$$

$$y \geq -1.5x + 100$$



5. Solve  $-2x^2 + 3x > -7$  graphically

$$-2x^2 + 3x + 7 = 0$$

$$2x^2 - 3x - 7 = 0$$

$$y\text{-int} = 7$$

$$x = \frac{3 \pm \sqrt{(-3)^2 - 4(2)(-7)}}{2(2)}$$

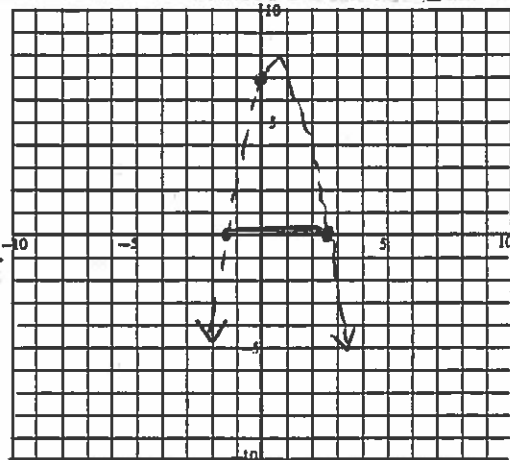
$$x = \frac{3 \pm \sqrt{9 + 56}}{4}$$

$$x = \frac{3 \pm \sqrt{65}}{4}$$

$$x \approx 2.77 \quad x \approx -1.27$$

Solution

$$\{x \mid -1.27 \leq x \leq 2.77, x \in \mathbb{R}\}$$



6. Graph each quadratic inequality.

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

a)  $y < -3x^2 - 3x + 1$

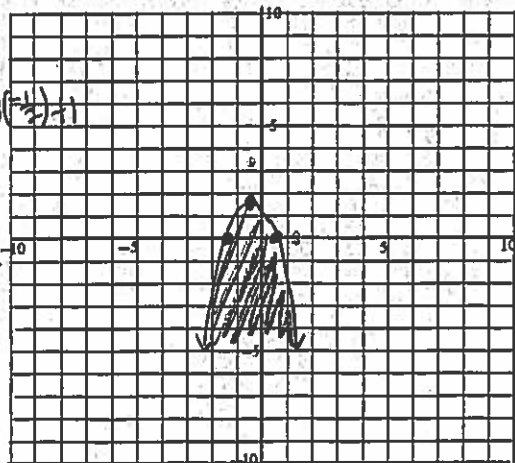
Vertex

$$x = \frac{-b}{2a} = \frac{3}{-6}$$

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

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

$$y = 1.75$$



X-int  $y = -3x^2 - 3x + 1$

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

$$x = \frac{3 \pm \sqrt{9 + 12}}{-6}$$

$$x = \frac{3 \pm \sqrt{21}}{-6}$$

$$x \approx -1.27 \quad x \approx 0.27$$

Test point

$$(0,0)$$

LHS

$$0 \text{ RHS}$$

$$0 < 1$$

b)  $y \leq 0.5x^2 + 4x - 1$

Vertex

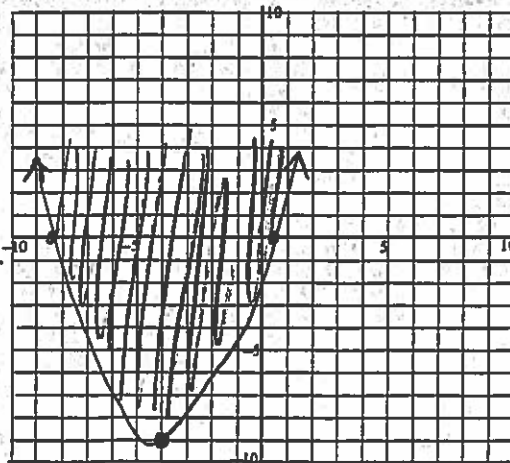
$$x = \frac{-b}{2a} = \frac{-4}{1} = -4$$

$$y = 0.5(4)^2 + 4(-4) - 1$$

$$y = -8 - 1$$

$$y = -9$$

$$(-4, -9)$$



Test point

$$(0,0)$$

LHS

$$0 \text{ RHS}$$

$$0.5(0)^2 + 4(0) - 1$$

$$0 \leq -1$$

X-int

$$0.5x^2 + 4x - 1 = 0$$

$$x = \frac{-4 \pm \sqrt{16 - 4(0.5)(-1)}}{2(0.5)}$$

$$x = \frac{-4 \pm \sqrt{18}}{1}$$

$$x \approx -8.24 \quad x \approx 0.24$$