SEND - IN ASSIGNMENT

Inequalities and Solving

Systems of Equations

Name: _____

Teacher:_____

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Formula

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

Total _____ **=** _____**%**

34

SHOW ALL WORK FOR FULL MARKS

1. Solve the following and graph the solution on the number line.

$4 - 2x > 3(x - 2)$

$4 - 2x > 3x - 6$

$4 + 6 > 5x$

$10 > 5x$

$x < 2$

1) $x < 2$

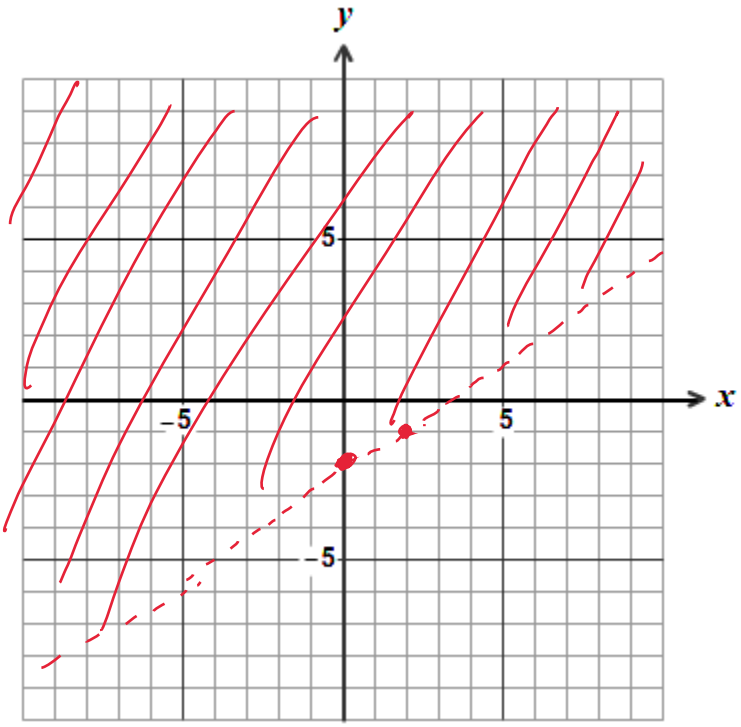
3 marks

2. Graph the inequality: $x - 2y < 4$

$x - 4 < 2y$

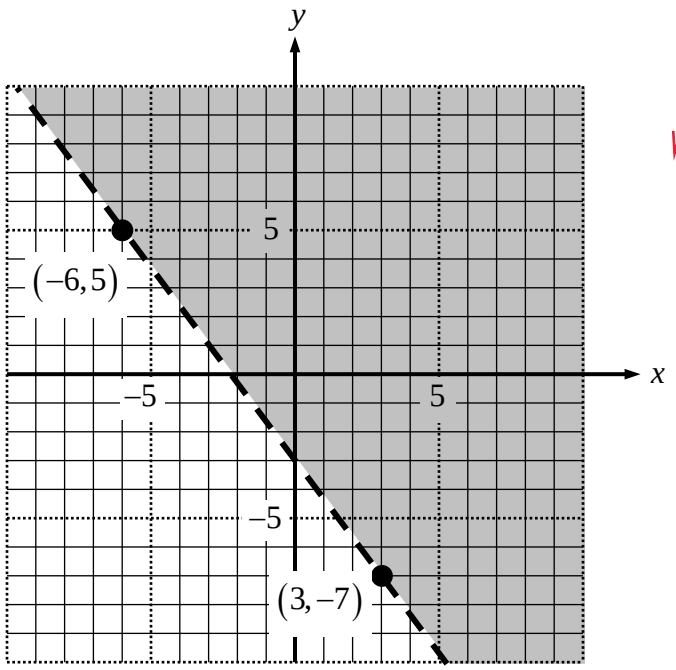
$y > \frac{x}{2} - 2$

x	y
0	-2
2	-1



3 marks

3. Write a linear inequality statement for the following graph:



$y = mx + b$

$m = \frac{5-(-7)}{-6-3} = -\frac{4}{3}$

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

$5 = -\frac{4}{3}(-6) + b$

$b = -3$

$y = -\frac{4}{3}x - 3 \rightarrow y > -\frac{4}{3}x - 3$

3) $y > -\frac{4}{3}x - 3$

3 marks

4. Michaela has up to $20 to spend on bottled water and orange juice for a group hike. It cost $2 for each bottle of water and $4 for each bottle of orange juice.

a) Write an inequality statement for this situation.

let bottle of water is x

bottle of orange juice is y

$2x + 4y \leq 20$

a) $2x + 4y \leq 20$

2 marks

b) Graph the inequality.

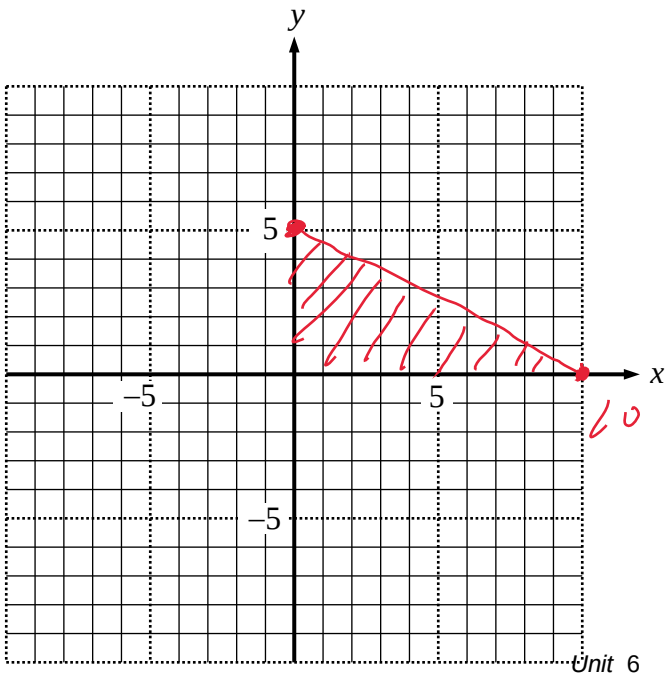
$2x + 4y \leq 20$

$4y \leq 20 - 2x$

$y \leq -\frac{1}{2}x + 5$

x	y
0	5
2	4
10	0

$\begin{cases} x \geq 0 \\ y \geq 0 \end{cases}$



3 marks

c) Can Michaela buy 5 bottles of water and 7 bottles of orange juice? Explain why or why not using the graph to justify your answer.

c) $2x+4y \leq 20$, $2(5)+4(7)=38>20$, the $(5, 7)$ is out of the graph, do not have enough money.

2 marks

5. Is the point $(-1, 20)$ is a solution for $y \leq \frac{1}{2}(x-5)^2+2$? Show work to support your answer for full marks.

$x=-1 \quad y=20$

left: 20, Right: $\frac{1}{2}(-1-5)^2+2$

$=\frac{1}{2}\times 36+2$

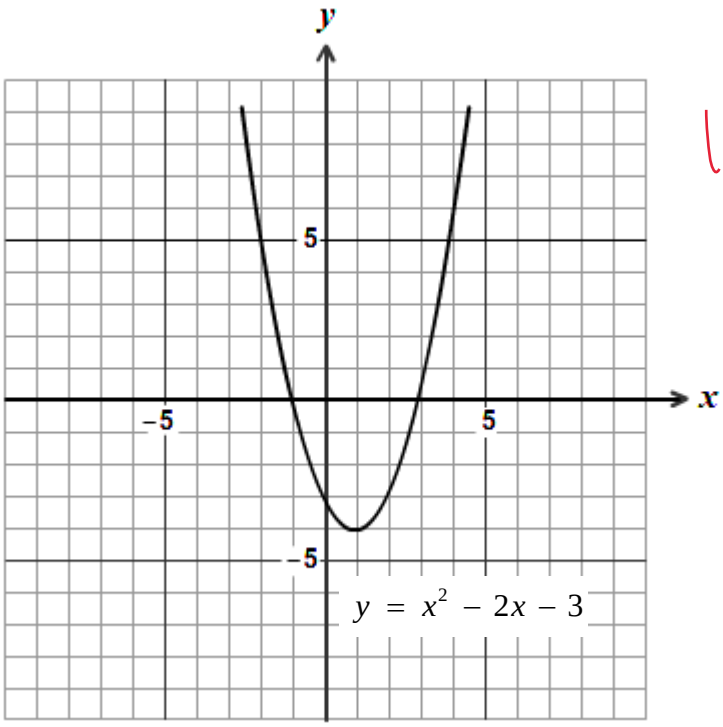
$=20$

$L=R$

5) Yes, it is.

2 marks

6. Given the graph of a quadratic function write the solution for the following quadratic inequality. $x^2-2x-3 \geq 0$.



$(x-3)(x+1) \geq 0$

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

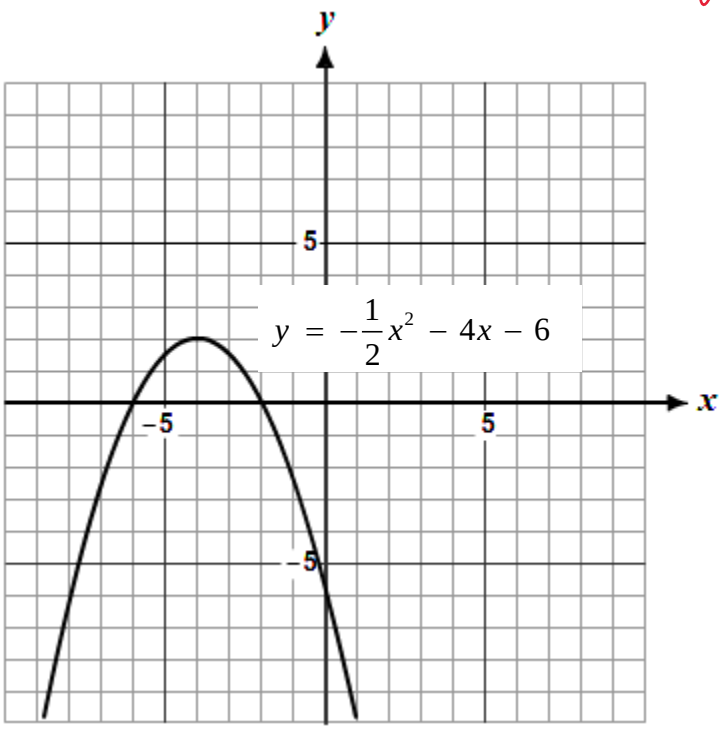
$x=3, -1$

$\therefore x \geq 3$ or $x \leq -1$

6) $x \geq 3$ or $x \leq -1$

2 marks

7. Given the graph of a quadratic function write the solution for the following quadratic inequality.
$-\frac{1}{2}x^2 - 4x - 6 > 0$.



let $-\frac{1}{2}x^2 - 4x - 6 = 0$

$x^2 + 8x + 12 = 0$

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

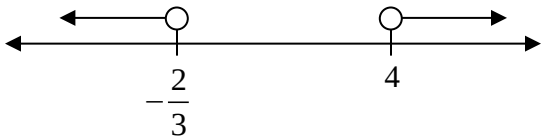
$x = -2, \ -6$

$-6 < x < -2$

7) $-6 < x < -2$

2 marks

8. Write a quadratic inequality in the form of $ax^2 + bx + c$ that represents the following solution.
No fractions in your answer.



"0" means excluded.

$x = -\frac{2}{3}, \ x = 4$

$(x + \frac{2}{3})(x - 4) > 0$

$x^2 - 4x + \frac{2}{3}x - \frac{8}{3} > 0$

$3x^2 - 12x + 2x - 8 > 0$

$3x^2 - 10x - 8 > 0$

8) $3x^2 - 10x - 8 > 0$

3 marks

9. Solve each of the quadratics using a number line and test points. Show your work.

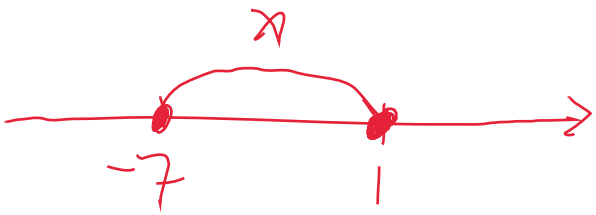
a) $x^2 + 6x - 7 \leq 0$

$(x-1)(x+7) \leq 0$

let $(x-1)(x+7) = 0$

$x = 1, -7$

$-7 \leq x \leq 1$



a) $-7 \leq x \leq 1$

3 marks

b) $2x^2 + 3x - 5 > 0$

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

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

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

$\therefore x > 1$ or $x < -\frac{5}{2}$

b) $x > 1$ or $x < -\frac{5}{2}$

3 marks

10. Solve the following quadratic inequalities by graphing the corresponding function.

$y \leq -2x^2 + 16x - 24$

$-2x^2+16x-24 = 0$

$x^2 - 8x + 12 = 0$

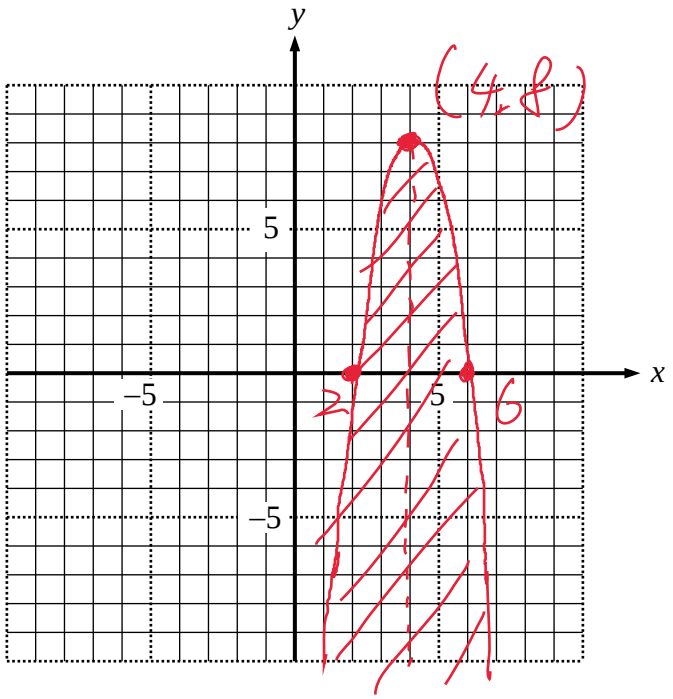
$(x-2)(x-6) = 0$

$x = 2, 6$

vertex: $x = \frac{2+6}{2} = 4$

$y = -2(4)^2+16(4)-24 = 8$

$(4, 8)$



10)

3 marks