

Pre-Calculus 11 Chapter 9 Test Practice.

Name: KEY

Date: _____

Block: _____

Multiple Choice For #1 to #5, choose the best answer.

1. An inequality that is equivalent to $3x - 6y < 12$ is

A $y < \frac{1}{2}x - 2$

B $y > \frac{1}{2}x - 2$

C $y < 2x - 2$

D $y > 2x - 2$

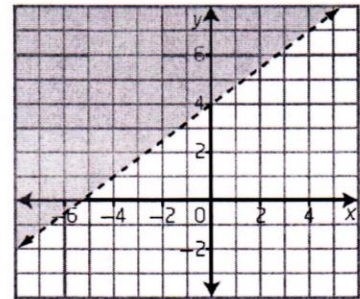
2. What linear inequality does the graph show?

A $y > \frac{3}{4}x + 4$

B $y \geq \frac{3}{4}x + 4$

C $y < \frac{3}{4}x + 4$

D $y \leq \frac{3}{4}x + 4$



3. What is the solution set for the quadratic inequality $6x^2 - 7x - 20 < 0$?

A $\{x \mid x \leq -\frac{4}{3} \text{ or } x \geq \frac{5}{2}, x \in \mathbb{R}\}$

B $\{x \mid -\frac{4}{3} \leq x \leq \frac{5}{2}, x \in \mathbb{R}\}$

C $\{x \mid -\frac{4}{3} < x < \frac{5}{2}, x \in \mathbb{R}\}$

D $\{x \mid x < -\frac{4}{3} \text{ or } x > \frac{5}{2}, x \in \mathbb{R}\}$

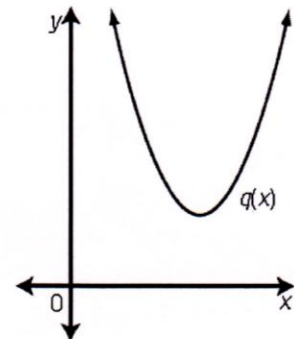
4. For the quadratic function $q(x)$ shown in the graph, which of the following is true?

A There are no solutions to $q(x) > 0$.

B All real numbers are solutions to $q(x) \geq 0$.

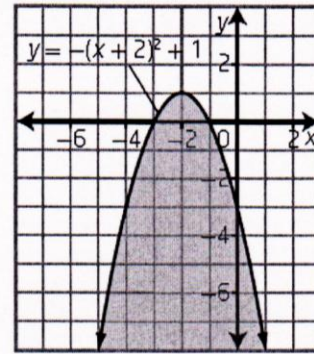
C All real numbers are solutions to $q(x) \leq 0$.

D All positive real numbers are solutions to $q(x) < 0$.



5. What quadratic inequality does the graph show?

- A $y < -(x+2)^2 + 1$
- B $y \geq -(x+2)^2 + 1$
- C $y \leq -(x+2)^2 + 1$
- D $y > -(x+2)^2 + 1$



Short Answer

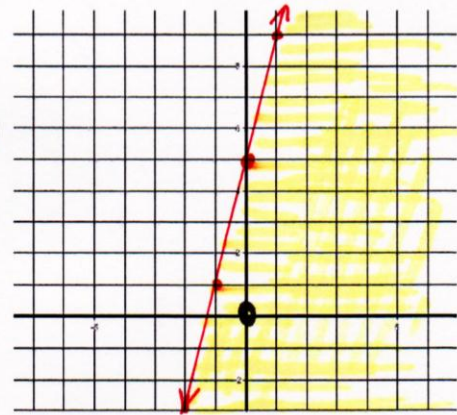
6. Graph $8x \geq 2(y-5)$.

$$8x \geq 2y - 10$$

$$8x + 10 \geq 2y$$

$$4x + 5 \geq y$$

test pt: (0,0)
true!



7. Solve $12x^2 < 7x + 10$.

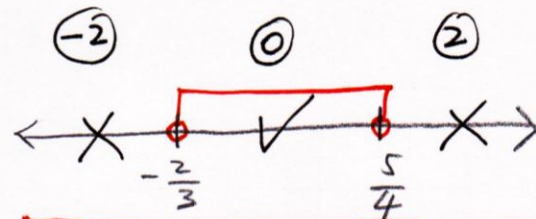
$$12x^2 - 7x - 10 < 0$$

Find roots:

$$12x^2 - 7x - 10 = 0$$

$$(3x+2)(4x-5) = 0$$

$$x = -\frac{2}{3} \text{ or } x = \frac{5}{4}$$

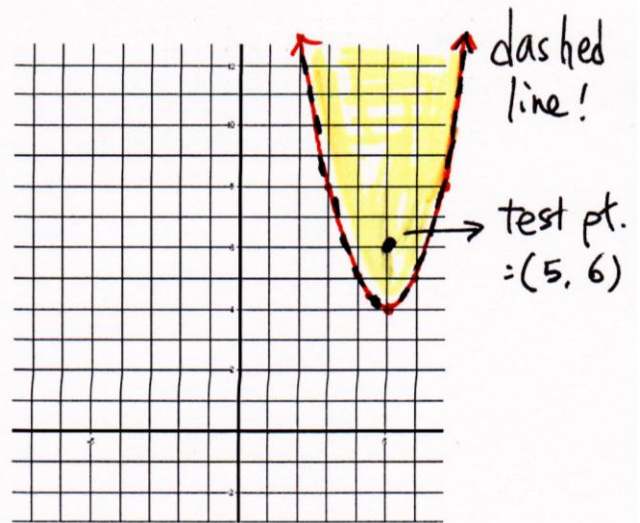


Solution: $-\frac{2}{3} < x < \frac{5}{4}, x \in \mathbb{R}$

8. Graph $y > (x-5)^2 + 4$.

V: (5, 4).

$$6 > (5-5)^2 + 4 \checkmark \text{ True!}$$

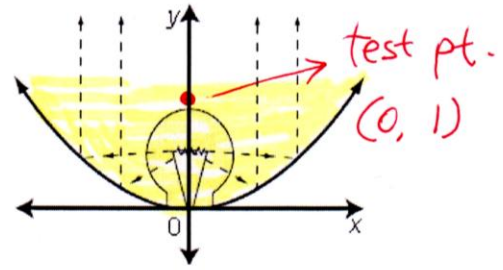


9. Stage lights often have parabolic reflectors to make it possible to focus the beam of light, as indicated by the diagram. Suppose the reflector in a stage light is represented by the function $y = 0.02x^2$. What inequality can you use to model the region illuminated by the light?

$$y \geq 0.02x^2$$

$$1 \geq 0.02(0)$$

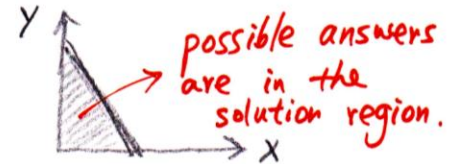
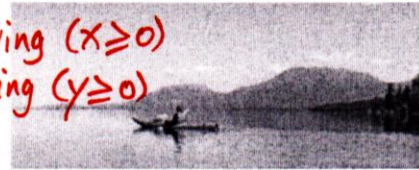
$$1 \geq 0$$



10. While on vacation, Ben has \$300 to spend on recreation. Scuba diving costs \$25/h and sea kayaking costs \$20/h. What are all the possible ways that Ben can budget his recreation money?

Let x represents # of hours scuba diving ($x \geq 0$)
and y represents # of hours sea kayaking ($y \geq 0$)

$$\$300 \geq \$25(x) + \$20(y)$$



11. Malik sells his artwork for different prices depending on the type of work. Pen and ink sketches sell for \$50, and watercolours sell for \$80.

- a) Malik needs an income of at least \$1200 per month. Write an inequality to model this situation.

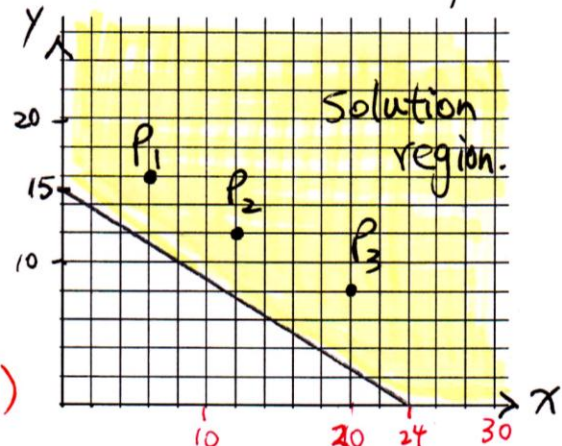
Let x represents Pen and ink sketches
 y represents watercolors

$$\$1200 \leq \$50x + \$80y$$

$$x \geq 0 \text{ and } y \geq 0$$

$$-50x + 1200 \leq 80y$$

$$-\frac{5}{8}x + 15 \leq y$$



- b) Graph the inequality. List three different ordered pairs in the solution.

3 possible answers:
(6, 16), (12, 12), (20, 8)

Answer may vary.

- c) Suppose Malik now needs at least \$2400 per month. Write an inequality to represent this new situation. Predict how the answer to this inequality will be related to your answer in part b).

$$\#2400 \leq 50x + 80y \quad \rightarrow \quad -50x + 2400 \leq 80y$$

$$-\frac{5}{8}x + 30 \leq y$$

This new line is parallel to the original line but with a greater y -intercept and x -intercept.

- d) Solve the new inequality from part c) to check your prediction.

$$y \geq -\frac{5}{8}x + 30$$

$$x \geq 0, \quad y \geq 0$$

12. The normal systolic blood pressure, p , in millimetres of mercury (mmHg), for a woman a years old is given by $p = 0.01a^2 + 0.05a + 107$.

- a) Write an inequality that expresses the ages for which you expect systolic blood pressure to be less than 120 mmHg. Find roots.

$$0.01a^2 + 0.05a + 107 < 120$$

$$0.01a^2 + 0.05a - 13 < 0$$

$$120 = 0.01a^2 + 0.05a + 107$$

$$0 = 0.01a^2 + 0.05a - 13$$

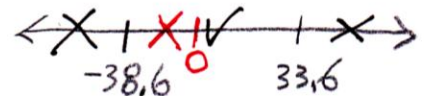
- b) Solve the inequality you wrote in part a).

$$a = \frac{-0.05 \pm \sqrt{0.0025 + 0.52}}{0.02}$$

$$\rightarrow 33.6$$

$$\rightarrow -38.6$$

reject age being negative.



$$\boxed{0 < x < 33.6}$$

$x \in \mathbb{R}$

- c) Are all of the solutions to your inequality realistic answers for this problem? Explain why or why not.

The acceptable answer is from 0 to 33.6, because age can not be negative.