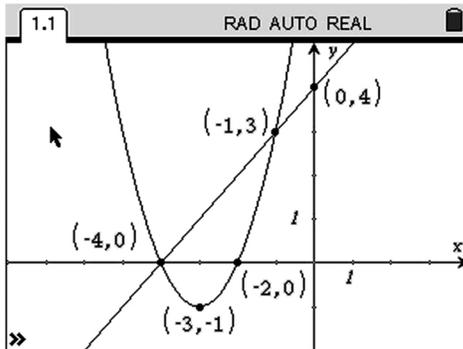


Unit 4 Test

Multiple Choice

For #1 to 5, choose the best answer.

1. The solution to the system of linear-quadratic equations shown on the graph is



- A (-1, 3) B (-3, -1)
 C (-4, 0) or (-1, 3) D (-4, 0) or (-2, 0)

2. How many solutions are there for the following system of equations?

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

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

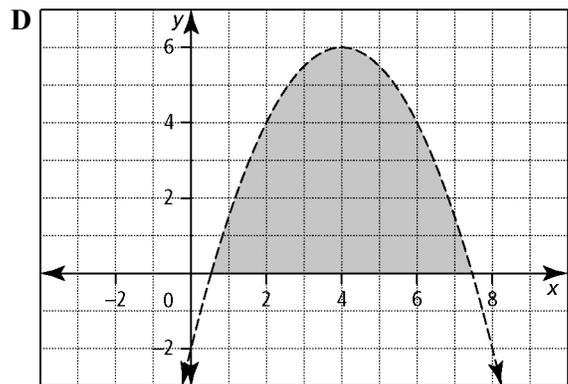
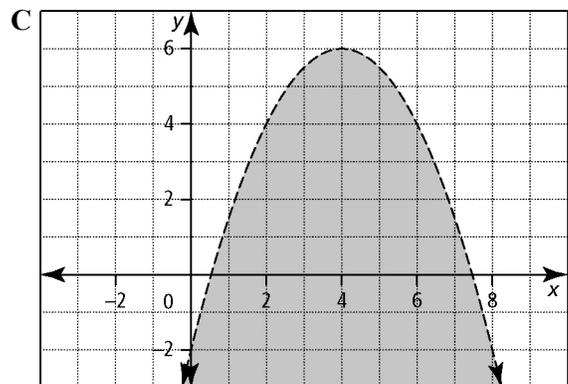
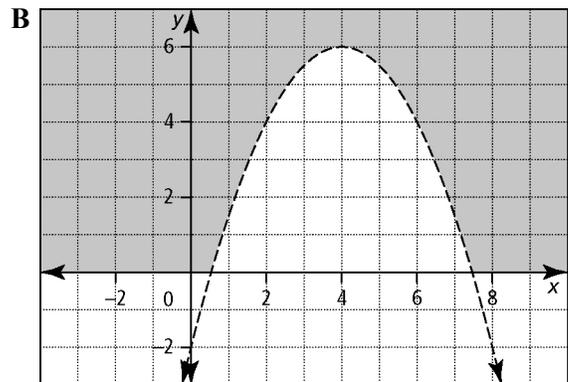
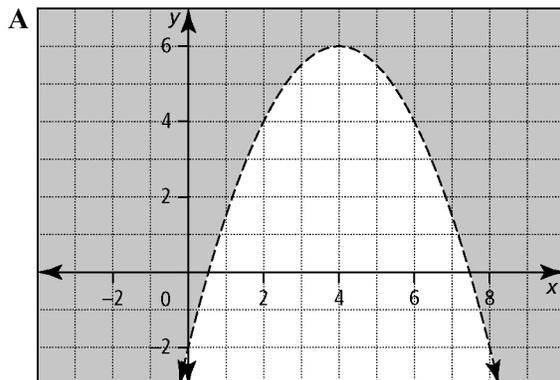
- A zero B one C two D an infinite number

3. Which test point should not be used to determine the solution region for the linear inequality $y < -\frac{1}{3}x + 2$?

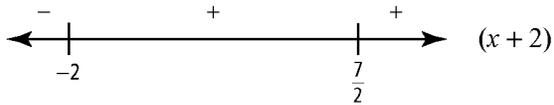
- A (0, 0) B (1, 1) C (3, 1) D (-2, 1)

4. Which graph represents the inequality

$$y > -\frac{1}{2}x^2 + 4x - 2?$$



5. A student uses sign analysis to determine the solution set for the inequality $2x^2 - 3x - 16 \geq -2$. The partial solution is shown.



The solution set for the inequality $2x^2 - 3x - 16 \geq -2$ is

- A** $\left\{x \mid -2 \leq x \leq \frac{7}{2}, x \in \mathbb{R}\right\}$
B $\left\{x \mid x \leq -2 \text{ or } x \geq \frac{7}{2}, x \in \mathbb{R}\right\}$
C $\{x \mid x \geq -2, x \in \mathbb{R}\}$
D $\left\{x \mid x \geq \frac{7}{2}, x \in \mathbb{R}\right\}$

Numerical Response

Complete the statements in #6 to 8.

6. The solutions to a system of linear-quadratic equations can be represented by ordered pairs in the form (a, b) . The largest value of b , to the nearest tenth, for the following system of equations is \square .

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

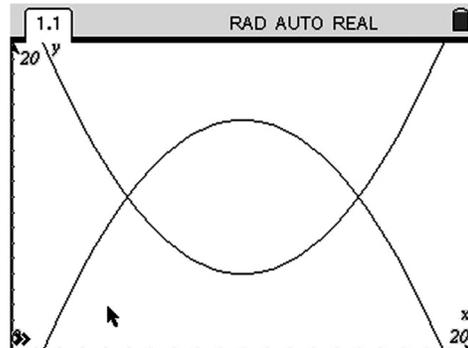
$$2x^2 - 5x + y - 1 = 0$$

7. For the quadratic-quadratic system of equations shown, the value of k that would result in an infinite number of solutions is \square .

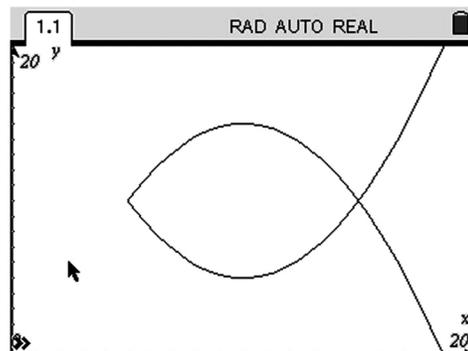
$$3x^2 - 5x + ky - 10 = 0$$

$$12x^2 - 20x + 5y - 40 = 0$$

8. You can use a graphing calculator to create parabolic art. You can draw a fish by graphing $y = 0.2(x - 10)^2 + 5$ and $-0.2(x - 10)^2 + 15$, using window settings of 0 to 20 for both axes. You get the following results.



To graph only the fish, as shown below, the domain of the graphs is restricted to $\{x \mid x \geq a, a \in \mathbb{R}\}$, where $a = \square$.

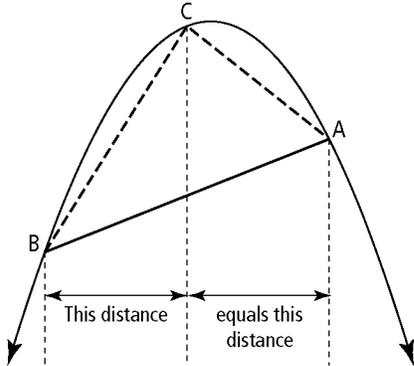


Written Response

9. Joseph has a budget of \$40 each month for movies and video games. Renting a movie costs \$5 and renting a video game costs \$8.
- Write an inequality to represent the number of movies and games that Joseph can rent within his budget. State what your variables represent.
 - Graph the solution.
 - Explain how the solution to the inequality relates to the situation.



- 10.** The Greek mathematician Archimedes used a method of decomposing a portion of a parabola into triangles to determine the area under the parabola. The parabola shown can be modelled by the equation $y = -2x^2 + 15x - 21$, and the solid line can be modelled by $x - y - 1 = 0$.



- a) Determine the points of intersection of the line and the parabola.
- b) Explain in words how you could determine the coordinates of vertex C of the triangle.

- 11.** Demonstrate one of the strategies to solve the inequality $6x^2 - 19x + 15 < 5$. You may wish to use case analysis, roots and test points, or sign analysis.

