Name: _____   Date: _____

Chapter 9 Test

Multiple Choice

For #1 to #5, select the best answer.

1. Which ordered pair makes the inequality $x + 3y < 6$ true?

   A $(-3, 4)$

   B $(1, -2)$

   C $(2, 3)$

   D $(6, 0)$

2. What would the graph of the inequality $2x + 5y < 18$ show?

   A a solid boundary line with shading above the line

   B a solid boundary line with shading below the line

   C a broken boundary line with shading above the line

   D a broken boundary line with shading below the line

3. Which of the following is a graph of the inequality $y \le 2x^2 - 2x - 12$?

A

B

C

D
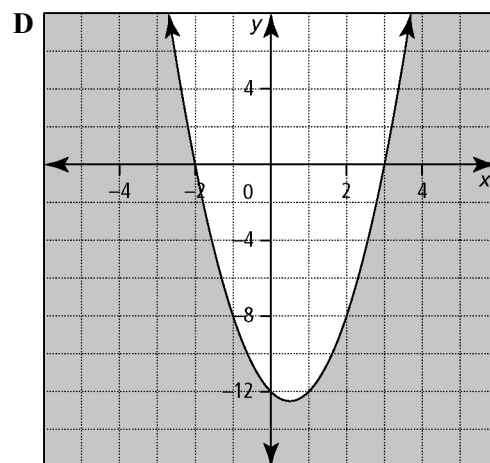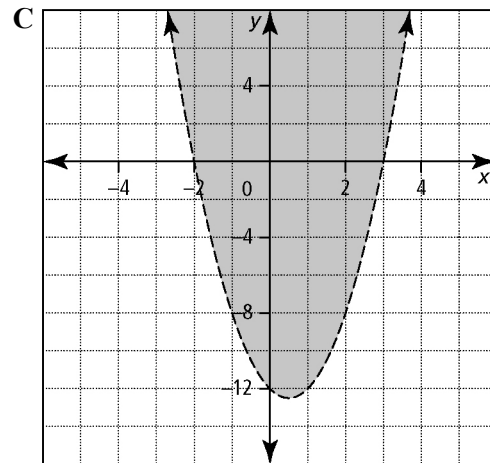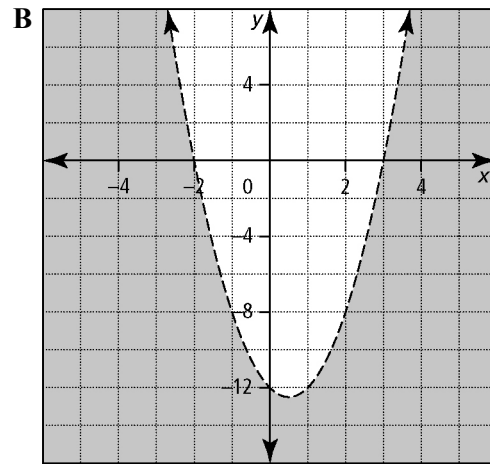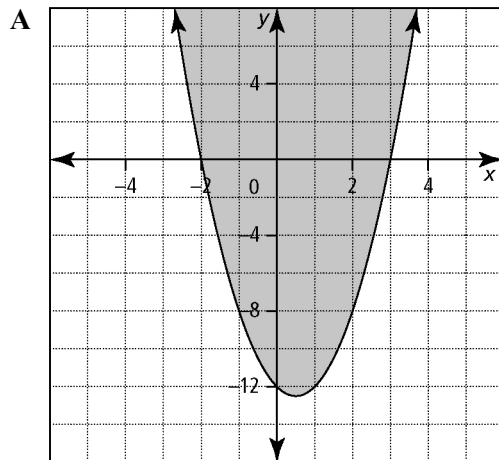
4. Rachel wants to graph the solution region for the inequality $5x - 2y + 8 > 0$. Her partial solution for isolating the y variable is shown below.

Step 1 $5x - 2y + 8 > 0$

Step 2 $-2y > -5x - 8$

Step 3 $y > \dfrac{-5x}{-2} - \dfrac{8}{-2}$

Step 4 $y > \dfrac{5}{2}x + 4$

In which step did Rachel make her first mistake?

A Step 1

B Step 2

C Step 3

D Step 4

5. What is the solution to the quadratic inequality $(x - 4)(x - 1) < 0$?

A $\{x \mid 1 < x < 4, x \in R\}$

B $\{x \mid x < -4 \text{ or } x > -1, x \in R\}$

C $\{x \mid -4 < x < -1, x \in R\}$

D $\{x \mid x < 1 \text{ or } x > 4, x \in R\}$

Short Answer

6. Explain how the test point (2, 3) could be used to determine the solution region for the graph of the inequality $x + 3y > 4$.

7. Why is test point (0, 0) not a good choice to determine the solution region that satisfies $4x - 2y \geq 0$?

8. Explain how the solution to a quadratic inequality in one variable differs from the solution region for a quadratic inequality in two variables.

9. Sketch the graph of the inequality $y > -3x + 4$. Use a test point to verify the solution region. Show your work.

10. Determine the solution interval for the quadratic inequality $-x^2 - 6x - 7 \geq 0$.

11. Sketch a graph of the solution to $y > -\dfrac{1}{2}x^2 - 3x + 1$. Use a test point to verify the solution region. Show your work.

Extended Response

12. Pierre wants to take his extended family to a movie at an IMAX theatre. He has a budget of $150 to spend on tickets. Tickets for children cost $9.50, and tickets for adults cost $13.95.

a) Write an inequality that represents the number of tickets that Pierre can afford.

b) Graph the solution region.

c) Interpret the solution set in reference to the number of tickets.

13. For each solution interval, provide an example of a quadratic inequality in the form $ax^2 + bx + c > 0$, along with a sketch of the graph.

a) $\{x \mid -1 < x < 2, x \in R\}$

b) $\{x \mid x \leq -4 \text{ or } x \geq 3, x \in R\}$

14. The royalties received by an author depend on the number of books sold and the price of each book. For a particular book, the royalties, R, in dollars, depend on the price, P, in dollars, according to the equation $R = 0.02P(20\,000 - 200P)$. For what range of prices would the author receive more than $8400 in royalties?