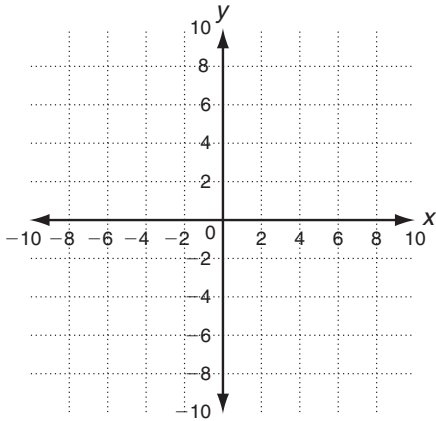


LESSON
5-7

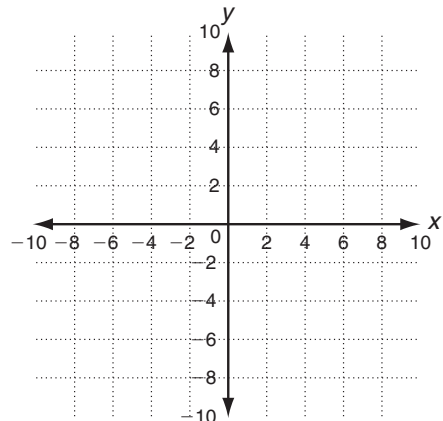
Practice C
Solving Quadratic Inequalities

Graph each inequality.

1. $y < -2x^2 - 5x + 6$



2. $y \geq x^2 - 6x + 2$



Solve each inequality.

3. $x^2 - 10x + 17 \geq -4$

4. $2x^2 - 7x - 2 < 2$

5. $3x^2 + 5 \leq 53$

6. $x^2 - 6x - 36 > 36$

Solve.

7. Use the Quadratic Formula to find the critical values for the inequality $x^2 - 3x + 8 \geq -2$.

8. The distance, d , in car lengths, that a drag racer travels during the course of a race is given by $d = 0.8t^2 - 3.5t$, where t is time in seconds.

a. How long does it take for a racer to travel at least 100 car lengths?

b. During what time period will the racer be more than 50 car lengths but less than 100 car lengths into the race?

c. During what time period will the racer be less than 50 car lengths from the start?

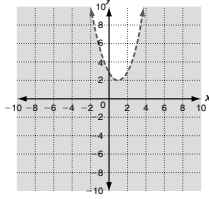
LESSON Practice A

5-7 Solving Quadratic Inequalities

Graph each inequality and shade the solution region. Use a test point to verify the solution region.

1. $y < x^2 - 2x + 3$

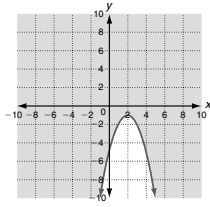
- a. y-intercept is 3.
b. Vertex is (1, 2).



c. Test point $(0, 0)$
 $0 < 3 \checkmark$

2. $y \geq -x^2 + 4x - 5$

- a. y-intercept is -5
b. Vertex is $(2, -1)$



c. Test point $(0, 0)$
 $0 \geq -5 \checkmark$

Solve each inequality by using algebra.

3. $x^2 + x - 8 \leq -6$

- a. Write the related equation.
b. Solve for x to find the critical values.

$$\begin{aligned} x^2 + x - 8 &= -6 \\ x &= -2, 1 \\ x = -3, -2 \leq -6 \checkmark; x = 0, -8 &\leq -6 \checkmark; x = 2, -2 \leq -6 \checkmark \\ -2 \leq x \leq 1 \end{aligned}$$

c. Test an x-value in each interval.

d. Write the solution.

4. $x^2 + 10x + 25 > 9$ 5. $x^2 - x < 12$ 6. $x^2 + 2x - 10 \geq 14$
 $x < -8 \text{ or } x > -2$ $-3 < x < 4$ $x \leq -6 \text{ or } x \geq 4$

Solve.

7. The annual profit, $p(x)$, in dollars of a small company varies with the number of employees, x , as $p(x) = -40x^2 + 4400x$. What is the range of the number of employees for which the company's annual profit will be at least \$112,000?

Between 40 and 70 employees

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Holt Algebra 2

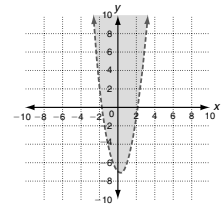
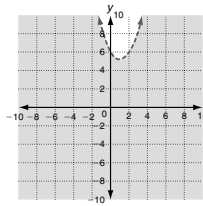
LESSON Practice B

5-7 Solving Quadratic Inequalities

Graph each inequality.

1. $y < x^2 - 2x + 6$

2. $y > 2x^2 - x - 7$



Solve each inequality by using tables or graphs.

3. $x^2 + 3x - 14 \leq 14$

$-7 \leq x \leq 4$

4. $x^2 - 9x > -18$

$x < 3 \text{ or } x > 6$

Solve each inequality by using algebra.

5. $x^2 - x - 3 > x$

$x < -1 \text{ or } x > 3$

6. $x^2 + 6x + 3 < -2$

$-5 < x < -1$

7. $3 \leq x^2 - 8x + 15$

$x < 2 \text{ or } x > 6$

8. $3x^2 + x + 8 \leq 12$

$-\frac{4}{3} < x < 1$

Solve.

9. An online music service that sells song downloads models its profit using the function $P(d) = -5d^2 + 450d - 1000$, where d is the number of downloads sold and P is the profit. How many downloads does it need to sell to make a profit of more than \$8000?

More than 30 but fewer than 60

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Holt Algebra 2

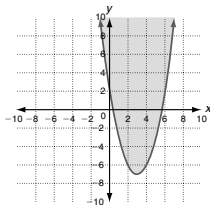
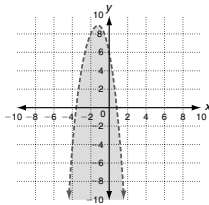
LESSON Practice C

5-7 Solving Quadratic Inequalities

Graph each inequality.

1. $y < -2x^2 - 5x + 6$

2. $y \geq x^2 - 6x + 2$



Solve each inequality.

3. $x^2 - 10x + 17 \geq -4$

$x \leq 3 \text{ or } x \geq 7$

4. $2x^2 - 7x - 2 < 2$

$-\frac{1}{2} < x < 4$

5. $3x^2 + 5 \leq 53$

$-4 \leq x \leq 4$

6. $x^2 - 6x - 36 > 36$

$x < -6 \text{ or } x > 12$

Solve.

7. Use the Quadratic Formula to find the critical values for the inequality $x^2 - 3x + 8 \geq -2$.

$x = \frac{3 \pm i\sqrt{31}}{2}$

8. The distance, d , in car lengths, that a drag racer travels during the course of a race is given by $d = 0.8t^2 - 3.5t$, where t is time in seconds.

- a. How long does it take for a racer to travel at least 100 car lengths?
b. During what time period will the racer be more than 50 car lengths but less than 100 car lengths into the race?
c. During what time period will the racer be less than 50 car lengths from the start?

13.6 s

More than 10.4 s but less than 13.6 s into the race

Less than 10.4 s into the race

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LESSON Reteach

5-7 Solving Quadratic Inequalities

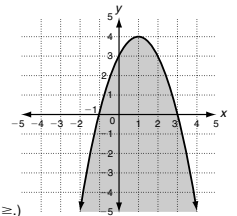
Graphing quadratic inequalities is similar to graphing linear inequalities.

Graph $y \leq -x^2 + 2x + 3$.

Step 1 Draw the graph of $y = -x^2 + 2x + 3$.

- $a = -1$, so the parabola opens downward.
- vertex at (1, 4)
- $-\frac{b}{2a} = -\frac{2}{2(-1)} = 1$, and $f(1) = 4$
- y-intercept is 3, so the curve also passes through (2, 3)

Draw a solid boundary line for \leq or \geq .
(Draw a dashed boundary line for $<$ or $>$.)



Step 2 Shade below the boundary of the parabola for $<$ or \leq . (Shade above the boundary for $>$ or \geq .)

Step 3 Check using a test point in the shaded region. Use (0, 0).

$y \leq -x^2 + 2x + 3$
 $?: 0 \leq -(0)^2 + 2(0) + 3$
 $\checkmark : 0 \leq 3$

Graph each inequality.

1. $y \geq x^2 - 4x + 3$

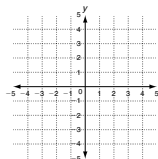
Vertex: $(2, -1)$

y-intercept: 3

Boundary: **solid boundary**

Test point: (1, 1)

$1 \geq 0$



2. $y < -x^2 - 4x - 1$

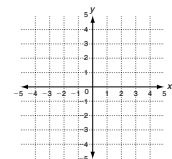
Vertex: $(-2, 3)$

y-intercept: -1

Boundary: **dashed boundary**

Test point: (-1, 0)

$0 < 2$



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