Unit 9 Student Diagnostic

These materials, when encountered before the denoted lesson, support access to the lesson and identify potential areas where additional support may be required. Note that the content in these lesson diagnostics represents prerequisite skills and does not address the required rigor for full mastery of the on-grade level standards.

Your students may benefit from using these materials in conjunction with the Unit Overview and Readiness page (quiz and mini-lessons).

Lesson 9.1: What Are Perfect Squares? Check-in

Determine if each number or expression is a perfect square. Then, explain how you know.

	Yes	No	Explanation
$\frac{1}{16}$	☐	☐	
9	☐	☐	
39	☐	☐	
121	☐	☐	
324	☐	☐	
x^2	☐	☐	
$100t$	☐	☐	
$49a^2$	☐	☐	
$3c^2$	☐	☐	
$(x - 1)^2$	☐	☐	

Lesson 9.2: Completing the Square, Part 1 Check-in

For each of the functions written in standard form, identify the coefficient of the quadratic term, the coefficient of the linear term, and the constant term.

Function	Coefficient of Quadratic Term	Coefficient of Linear Term	Constant Term
$f(x) = x^2 + 2x + 1$			
$g(x) = x^2 - 6x + 9$			
$h(x) = x^2 + 16x + 64$			
$j(x) = x^2 + 10x + 25$			
$k(x) = x^2 - 8x + 16$			
$m(x) = x^2 + 18x + 81$			
$n(x) = 9x^2 + 6x + 1$			
$p(x) = x^2 - 2x + 1$			

Lesson 9.3: Completing the Square, Part 2 Check-in

For each value of b, find $\left(\frac{b}{2}\right)^2$.

1. $b = 6$

2. $b = \frac{1}{2}$

3. $b = \frac{2}{5}$

4. $b = 0.8$

Lesson 9.4: Completing the Square, Part 3 Check-in

Use any method you prefer to rewrite these expressions into standard form.

1. $(2x + 1)(2x - 3)$

2. $(4x - 1)(\frac{1}{2}x - 3)$

3. $(3x - 5)^2$

4. $(2x + 1)^2$

Lesson 9.5: Quadratic Equations with Irrational Solutions Check-in

Solve each of these equations. Represent the solutions exactly. If the solution is not a whole number, what 2 whole numbers does each solution lie between?

1. $(x + 1)^2 = 64$

2. $(x - 3)^2 - 4 = 0$

3. $x^2 = 10$

4. $(x + 3)^2 = 24 + 4$

Lesson 9.6: The Quadratic Formula Check-in

Find the value of these expressions.

1. $\sqrt{9} + 2$

2. $\frac{\sqrt{16}}{2}$

3. $(\sqrt{25})^2 + 6.2$

4. $\frac{\sqrt{100}}{4} - \frac{\sqrt{64}}{2}$

5. $\sqrt{1 + 15}$

6. $\sqrt{4^2 + 3^2}$

Lesson 9.7: Applying the Quadratic Formula Check-in

For each equation below, identify a, b, and c as needed for use in the quadratic formula. Then, compute $b^2 - 4ac$. Note, some equations may need to be rewritten into standard form.

Function	a	b	c	$b^2 - 4ac$
$0 = x^2 - 3x + 5$				
$3x^2 - 6 + x = 0$				
$-2x^2 + 5x = 11$				
$3x^2 + 5x = 9 - 4x$				

Lesson 9.8: Deriving the Quadratic Formula Check-in

Here is Jose's work to solve an equation. Determine the error he made and explain the correct way to solve it.

$x = -3 + \sqrt{3^2 - 4 \cdot 1 \cdot 2}$

$x = -3 + 3 - 2 \cdot 1 \cdot 2$

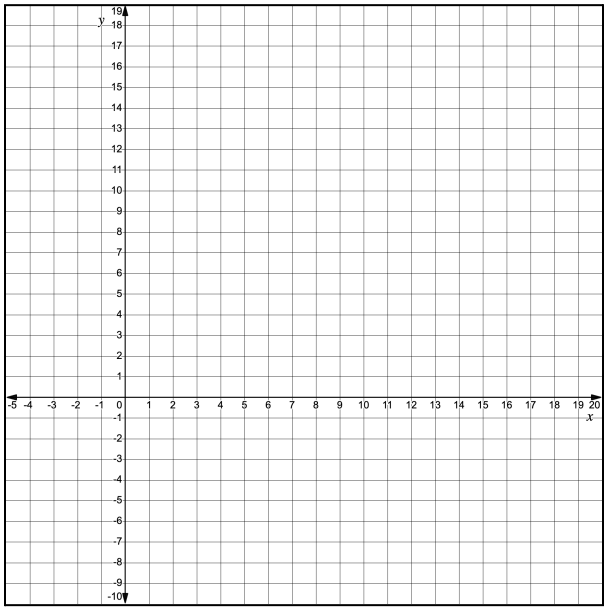
$x = -4$

Lesson 9.9: Writing Quadratics in Different Forms Check-in

For the solution given below, explain what happened in each step and why that step is taken.

Solve $x^2 + 8x - 3 = 6$.	**Explanation**
$x^2 + 8x = 6 + 3$	
$x^2 + 8x + 16 = 9 + 16$	
$(x + 4)^2 = 25$	
$x + 4 = \pm 5$	
$x = -4 \pm 5$	
$x = 1$ and $x = -9$	

Lesson 9.10: Rewriting Quadratic Expressions in Vertex Form Check-in



1. Sketch a graph of the function $f(x) = x^2 - 10x + 16$.

2. Find the coordinates of the x-intercept(s).

3. Find the coordinates of the y-intercept.

4. Find the coordinates of the vertex.

5. Draw a dashed line along the line of symmetry for the graph.

6. What do you notice about the line of symmetry as it relates to the vertex?

7. What do you notice about the line of symmetry as it relates to the x-intercept(s)?

8. Use the line of symmetry and the y-intercept to find another point on the parabola.

Lesson 9.11: Using Quadratic Expressions in Vertex Form to Solve Problems Check-in

Evaluate each function for $x = 3$.

1. $f(x) = x^2 - 4x + 1$

   $f(3) =$

2. $g(x) = 6x - 2x^2$

   $g(3) =$

3. $h(x) = (x - 4)(x - 3)$

   $h(3) =$

4. $j(x) = 2(x - 1)(x + 2)$

   $j(3) =$