1. How can you find out if a quadratic equation has only one solution without solving the equation?

2. How many solutions does $y = 5x^2 - 10x + 5$ have? Explain.

3. Write a quadratic equation with no real solutions.

4. Write a quadratic equation that has two solutions.

5. How can you use the discriminant to write an equation that has one solution?

6. Explain how to use a graph to find the number of solutions to a quadratic equation.

7. Use the discriminant to predict the number and type of solutions of this equation: $9x^2 + 6x = -1$
Then, use a graphing calculator to check your solution. Describe how the graph verifies your answer.

8. Explain how to determine whether the graph of a quadratic function crosses the *x*-axis.

[1] Answers may vary. Sample: Find the discriminant, $b^2 - 4ac$. If it equals 0, there is only one solution.

[2] one; the value of $b^2 - 4ac$ is $(-10)^2 - 4(5)(5) = 0$.

[3] Answers may vary. Sample: $x^2 = -4$

[4] Answers may vary. Sample: $x^2 + 4x + 3 = 0$

[5] Choose a, b, and c so that $b^2 - 4ac = 0$.

[6] The number of x-intercepts tells you the number of solutions. Two x-intercepts means two solutions, one x-intercept means one solution, and zero x-intercepts means no solutions.

[7] one real solution; the graph touches the x-axis in only one point.

[8] Find the value of the discriminant, which indicates the number of x-intercepts.