Algebra 2H HW #_____ Name_____
Worksheet 5D
Sections 5.5 and 5.6 Date_____Per._____Col._____

Solve by completing the square:

1. $x^2 + x - \frac{1}{5} = 0$

2. $9x^2 - 12x + 14 = 0$

Solve using the quadratic formula:

3. $-7x^2 + 2x = -9$

4. $40x - 7x^2 = 101 - 3x^2$

5. $x^2 + 2\sqrt{3}\,x - 3 = 0$

6. $ix^2 - 3x - 2i = 0$

Find the value of the discriminant and determine the nature of the solutions of each equation without solving the equation. Specify how many and whether the solutions are real, conjugate imaginary, rational, or irrational.

7. $x^2 + 8x - 20 = 0$

8. $3x^2 = 8x + 5$

9. $x^2 - x + \frac{5}{4} = 0$

10. $x^2 + \frac{7}{3}x - 2 = 0$

11. $\sqrt{2}\,x^2 - \sqrt{8} = 0$

Use the discriminant to determine the real values of k for which the equation has the specified solutions.

13. $kx^2 - 4x + 8 = 0$; 1 real solution

14. $kx^2 + 6x + k = 0$; 2 conjugate imaginary solutions

15. Investigation Activity

Sketch a "quick graph" (use vertex and direction of opening) for each parabola. Use the discriminant to determine the number and nature of the solutions for the equation when $y = 0$.

a) $y = 2x^2 + 1$

b) $y = -x^2 - 2x - 1$

c) $y = 3x^2 - 18x + 24$

Explain the relationship between the discriminant and the graph of a parabola.