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13.1.D2 ~ The Quadratic Formula

Past due on_____ Period____

Use the discriminant to determine the number of zeros or roots each quadratic function has. (If necessary, refer to the 13.1 example "Determining the Number of Roots for a Quadratic Function" in the Chapter 13 Summary.)

1) $y = x^2 + 4x + 3$

2) $y = -3x^2 - 12x - 12$

3) $y = 2x^2 - 5x + 10$

4) $y = -x^2 - x$

Use the Quadratic Formula to determine the exact zeros or roots of each function or equation. Solve for EXACT solutions; rewrite the roots in simplified radical form. (If necessary, refer to the 13.1 example "Using the Quadratic Formula to Determine the Zeros of a Quadratic Function or the Roots of a Quadratic Equation" in the Chapter 13 Summary.)

5) $5x^2 + 8x - 3 = 1$

6) $f(x) = -2x^2 + 5x - 1$

Solve the problem using the Quadratic Formula.

7) A water balloon is thrown upward from a height of 5 feet with an initial velocity of 35 feet per second. The quadratic function $h = -16t^2 + 35t + 5$ represents the height of the balloon, h, in feet t seconds after it is thrown. How long does it take for the balloon to reach the ground? (Round your solution to the nearest tenth of a second.)

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Solve each quadratic equation by taking square roots. Approximate the solutions to the nearest hundredth. (If necessary, refer to the 12.6 example "Extracting Square Roots to Solve Equations" in the Chapter 12 Summary.)

8) $(k + 12)^2 = 97$

9) $(7 - k)^2 = 37$

Rewrite each radical by extracting all perfect squares. SHOW ALL WORK. (If necessary, refer to the 12.6 example "Simplifying Square Roots" in the Chapter 12 Summary.)

10) $\sqrt{192}$

11) $\sqrt{108}$

12) $\sqrt{252}$

13) $\sqrt{147}$

14) If $8x^2 - 6x - 9$ is factored as $(ax + b)(cx - d)$ when a, b, c, and d are positive integers, then what is the value of b?

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