Algebra 1 Name Key Date

Unit 3 Study Guide B

***Factoring and Solving Quadratic Equations*: MGSE9-12.A.REI.4 & MGSE9-12.A.REI.4b**

Remember to show work!

Use factoring and the Zero-Product Property to find the zeros (solutions) of the quadratic equations.

1. $x^2 - 14x - 15 = 0$

$(x-15)(x+1) = 0$

$\{-1, 15\}$

2. $3x^2 + 2x - 8 = 0$

$x^2 + 2x - 24$

$(x+\frac{6}{3})(x-\frac{4}{3})$

$\{-2, \frac{4}{3}\}$

3. $5x^2 + 4x - 12 = 0$

$x^2 + 4x - 60 = 0$

$(x+\frac{10}{5})(x-\frac{6}{5}) = 0$

$\{-2, \frac{6}{5}\}$

4. $2x^2 - 50 = 0$

$2(x^2 - 25) = 0$

$\{\pm 5\}$

5. $x^2 + 3x - 10 = 0$

$(x+5)(x-2)$

$\{-5, 2\}$

6. $5x^2 + 10x + 5 = 0$

$5(x^2 + 2x + 1) = 0$

$\{-1\}$

Solve each equation by using square roots.

7. $\frac{3x^2}{3} = \frac{27}{3}$

$x^2 = 9$

$x = \pm 3$

8. $(x + 8)^2 = 32$

$x + 8 = \pm\sqrt{32}$

$x + 8 = \pm 4\sqrt{2}$

$x = -8 \pm 4\sqrt{2}$

9. $3(x - 2)^2 + 4 = 52$

$-4 \quad -4$

$\frac{3(x-2)^2}{3} = \frac{48}{3}$

$(x-2)^2 = 16$

$x - 2 = 4$ $\qquad$ $x - 2 = -4$

$x = 6$ $\qquad$ $x = -2$

$\{-2, 6\}$

Solve each equation by completing the square.

10. $x^2 - 6x + 5 = 0$

$x^2 - 6x + 9 = -5 + 9$

$(x-3)^2 = 4$

$x - 3 = 2$ $\quad$ $x - 3 = -2$

$+3 \quad +3$ $\quad$ $+3 \quad +3$

$x = 5$ $\quad$ $x = 1$

11. $-12x = 3x^2 - 9$

$3x^2 + 12x - 9 = 0$

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

$x^2 + 4x + 4 = 3 + 4$

$\sqrt{(x+2)^2} = \sqrt{7}$

$x = -2 \pm \sqrt{7}$

Use the quadratic formula to solve the equations.

12. $-7x^2 - 5x + 1 = 0$

$$\frac{-(-5) \pm \sqrt{(-5)^2 - 4(-7)(1)}}{2(-7)}$$

$$\frac{5 \pm \sqrt{53}}{-14}$$

13. $x^2 - 4x - 12 = 0$

$$\frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(-12)}}{2(1)}$$

$$\frac{4 \pm \sqrt{64}}{2} = \frac{4 \pm 8}{2}$$

$\{6, -2\}$

14. $x^2 - 5x + 6 = 0$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(6)}}{2(1)} = \frac{5 \pm \sqrt{1}}{2}$$

$$\frac{5 \pm 1}{2}$$

$$\frac{5+1}{2} \quad \frac{5-1}{2}$$

$\{3, 2\}$

***Error Analysis*: Find and circle the error. Then give the correct answer.**

15. Solve the equation by completing the square.

$x^2 - 8x + 12 = 0$

$x^2 - 8x = -12$

$x^2 - 8x + 16 = -12 + 16$

$(x-4)^2 = 28$ ~~4~~

$x - 4 = \sqrt{28}$

$x = 4 \pm 2\sqrt{7}$

$x^2 - 8x = -12$

$x^2 - 8 + 16 = -12 + 16$

$\sqrt{(x-4)^2} = \sqrt{4}$

$x - 4 = 2$ $\quad$ $x - 4 = -2$

$+4 \quad +4$ $\quad$ $+4 \quad +4$

$x = 6$ $\quad$ $x = 2$

$\{2, 6\}$