5.2 Re-Teach Worksheet

Name KEY

Intermediate Algebra B

5.2 I can represent real-world situations with quadratic equations and solve using appropriate methods.

Level 1:

Solve the quadratic Equations:

1. $2x^2 - 1 = 49$

$+1 \quad +1$

$\frac{2x^2}{2} = \frac{50}{2}$

$\sqrt{x^2} = \sqrt{25}$

$x = 5 \quad x = -5$

2 equations + -

$2x^2 - 1 = 49$

$+1 \quad +1$

$2x^2 - 50 = 0$

$a = 2 \quad b = 0 \quad c = -5$

$x = \frac{0 \pm \sqrt{0^2 + 4(2)(50)}}{2(2)}$

$x = \frac{0 \pm \sqrt{400}}{4}$

$x = \frac{0 \pm 20}{4}$

$x = 5 \quad x = -5$

2. $x^2 - 5x = 6$

$x^2 - 5x - 6 = 0$

$(x-6)(x+1)$

$x - 6 = 0 \quad x + 1 = 0$

$x = 6 \quad x = -1$

$x^2 - 5x = 6$

$x^2 - 5x - 6 = 0$

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

$x = \frac{5 \pm \sqrt{49}}{2}$

$x = \frac{5 \pm 7}{2}$

$x = \frac{5+7}{2} = 6$

$x = \frac{5-7}{2} = -1$

3. $3(x-1)^2 + 5 = 32$

$-5 \quad -5$

$\frac{3(x-1)^2}{3} = \frac{27}{3}$

$\sqrt{(x-1)^2} = \sqrt{9}$

$x - 1 = 3 \quad x - 1 = -3$

$x = 4 \quad x = -2$

4. $7x^2 = -16x - 11$

$-7x^2 - 16x = 11$

$a: 7 \quad b: 16 \quad c: -11$

$x = \frac{16 \pm \sqrt{(-16)^2 - 4(-7)(-11)}}{2(-7)}$

$x = \frac{16 \pm \sqrt{52}}{-14}$

$x = \frac{16 \pm 2\sqrt{13}}{-14}$

$\frac{8 \pm i\sqrt{3}}{7}$

5. $16x^2 = -1 - 8x$

$16x^2 - 1 - 8x = 0$

$a = 16 \quad b = -8 \quad c = -1$

$x = \frac{8 \pm \sqrt{(-8)^2 - 4(-16)(-1)}}{2(-16)}$

$x = \frac{8 \pm \sqrt{0}}{-32} \quad x = \frac{8 \pm 0}{-32} \quad x = \frac{-8}{-32} = .25$

6. $x^2 - 2x = 6$

$x^2 - 2x - 6 = 0$

$a: 1 \quad b: -2 \quad c: -6$

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

$x = \frac{2 \pm \sqrt{28}}{2}$

$x = \frac{2 \pm 2\sqrt{28}}{2}$ $\sqrt{4}\sqrt{7}$ $2\sqrt{7}$

$x = 1 \pm 1\sqrt{7}$

7. The Buckingham Fountain in Chicago shoots water from a nozzle at the base of the fountain. The height, in feet, of the water above ground t seconds after it leaves the nozzle is given by

$$h(t) = -16t^2 + 90t + 15$$

a) What is the maximum height of the water spout to the nearest tenth of a foot?

141.6 ft

b) How long does it take for the water to hit the ground?

$0 = -16t^2 + 90t + 15$

$\frac{-90 \pm \sqrt{90^2 - 4(-16)(15)}}{2(-16)}$

$\frac{-90 \pm \sqrt{9060}}{-32}$

$\frac{-90 \pm 95.2}{-32}$

$\frac{-90 + 95.2}{-32}$ $\quad \frac{-90 - 95.2}{-32} = 5.79$

$-.1625$

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Simplify the following Radicals:

7. $\sqrt{-75}$

$i\sqrt{75}$

$i\sqrt{3}\sqrt{25}$

$i\sqrt{3}\ 5$

$5i\sqrt{3}$

8. $2\sqrt{96}$

$2\sqrt{16}\sqrt{6}$

$2 \cdot 4\sqrt{6}$

$8\sqrt{6}$

9. $\sqrt{45}$

$\sqrt{9}\sqrt{5}$

$3\sqrt{5}$

10. $\frac{4\pm\sqrt{32}}{2}$

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

11. $\frac{3\pm\sqrt{81}}{2}$

$\frac{3-9}{2} = \frac{-6}{2}$ $\frac{3+9}{2} = \frac{12}{2}$

$x=-3$ $x=6$

12. $\frac{-8\pm\sqrt{-100}}{4}$

$\frac{-8 \pm 10i}{4}$

$\frac{-4 \pm 5i}{2}$

$\sqrt{16}\sqrt{3}$

$4\sqrt{3}$

13. $\frac{7\pm\sqrt{25}}{2(2)}$

$\frac{7 \pm 5}{4}$

$\frac{7+5}{4}$ $\frac{7-5}{4}$

$\frac{12}{4} = 3$ $\frac{2}{4} = .5$

14. $\frac{-4\pm\sqrt{48}}{2(3)}$

$\frac{-4 \pm 4\sqrt{3}}{6}$

$\frac{-2 \pm 2\sqrt{3}}{3}$