Name:	Date:	Period:

4.2 Solving Quadratic Equations by Square Roots Notes

Warm up

What value of x would make the equation true?

$x^2 = 9$

$x = -3, 3$

$(-3)^2 = 9$

$3^2 = 9$

Solving Quadratics by Square Roots

Quadratic equations of the form

$ax^2 + c = 0$

Can be solved using the **Square Root Property:**

If $x^2 = n$, then

$x = \pm\sqrt{n}$

1. **ISOLATE** x^2 Get it alone on one side.
2. **SQUARE ROOT** both sides.
3. **SIMPLIFY** the radical. Make sure to include $\pm$.

Ex1:

$x^2 - 64 = 0$

$+64 \quad +64$

$x^2 = 64$ ①

$\sqrt{x^2} = \pm\sqrt{64}$ ②

$x = \pm 8$ ③

OR

$x = \{-8, 8\}$

Ex2:

$7x^2 + 8 = 15$

$-8 \quad -8$

$\frac{7x^2}{7} = \frac{7}{7}$

$x^2 = 1$

$x = \pm\sqrt{1}$

OR

$x = \{-1, 1\}$

Ex3:

$$2x^2 - 9 = 55$$
$$+9 \quad +9$$
$$2x^2 = 64$$
$$\frac{2x^2}{2} = \frac{64}{2}$$
$$x^2 = 32$$
$$x = \pm\sqrt{32}$$
$$x = \pm\sqrt{16 \cdot 2}$$
$$x = \pm 4\sqrt{2}$$

or

$$x = \{-4\sqrt{2}, 4\sqrt{2}\}$$

Ex4:

$$4 - 3x^2 = -77$$
$$-4 \quad -4$$
$$-3x^2 = -81$$
$$\frac{-3x^2}{-3} = \frac{-81}{-3}$$
$$x^2 = \sqrt{27}$$
$$x = \pm\sqrt{27}$$
$$x = \pm\sqrt{9 \cdot 3}$$
$$x = \pm 3\sqrt{3}$$

OR

$$x = \{-3\sqrt{3}, 3\sqrt{3}\}$$