Name_____ Class_____ Date_____

Lesson 10-4 *(pp. 529–534)*

Solving Quadratic Equations

Lesson Objectives	**NAEP 2005 Strand:** Algebra
1 Solve quadratic equations by graphing	**Topic:** Equations and Inequalities
2 Solve quadratic equations using square roots	**Local Standards:** _____

Key Concepts

Standard Form of a Quadratic Equation

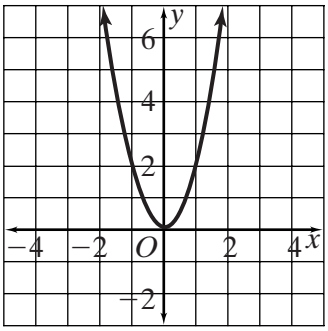
A quadratic equation is an equation that can be written in the form ☐ where $a \neq 0$. This form is called the ☐ form of a quadratic equation.

Example

1 Solving by Graphing Solve each equation by graphing the related function.

a. $2x^2 = 0$

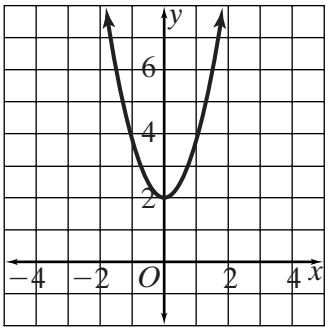
Graph $y = 2x^2$



There is one solution, $x =$ ☐.

b. $2x^2 + 2 = 0$

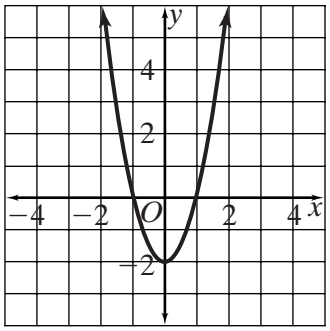
Graph $y = 2x^2 + 2$



There is ☐ solution.

c. $2x^2 - 2 = 0$

Graph $y = 2x^2 - 2$

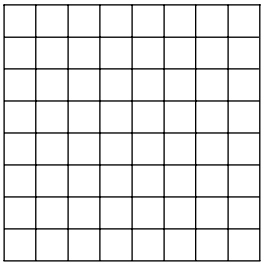


There are two solutions, $x =$ ☐ and $x =$ ☐.

Check Understanding

1. Solve each equation by graphing the related function.

a. $x^2 - 1 = 0$



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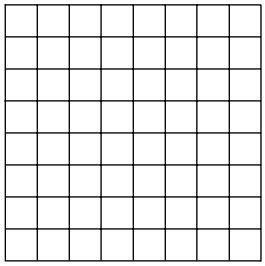
b. $2x^2 + 4 = 0$



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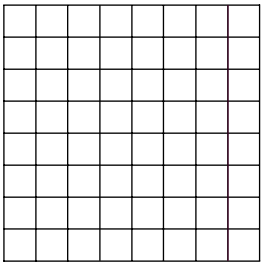
c. $x^2 - 16 = -16$



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Examples

❷ Using Square Roots Solve $3x^2 - 75 = 0$.

$3x^2 - 75 + \square = 0 + \square$ **Add $\square$ to each side.**

$3x^2 = \square$

$x^2 = \square$ **Divide each side by $\square$.**

$x = \pm\sqrt{\square}$ **Find the square roots.**

$x = \square$ **Simplify.**

❸ Applying Quadratic Equations A museum is planning an exhibit that will contain a large globe. The surface area of the globe will be 315 ft^2. Find the radius of the sphere. Use the equation $S = 4\pi r^2$, where S is the surface area and r is the radius.

$S = 4\pi r^2$

$\square = 4\pi r^2$ **Substitute $\square$ for S.**

$\frac{\square}{4\pi} = r^2$ **Put in calculator-ready form.**

$\sqrt{\frac{\square}{4\pi}} = r$ **Find the principal square root.**

$\square \approx r$ **Use a calculator.**

The radius of the sphere is about $\square$ ft.

Check Understanding

2. Solve each equation.

a. $t^2 - 25 = 0$

b. $3n^2 + 12 = 12$

c. $2g^2 + 32 = 0$

3. A city is planning a circular fountain. The depth of the fountain will be 3 ft. The maximum volume will be 1800 ft.^{3} Find the radius of the fountain using the equation $V = \pi r^2 h$, where V is the volume, r is the radius, and h is the depth.

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