

# 12.3 Solve Quadratics using Square Roots

## PRACTICE

Solve. Express your answer in decimal form. Round to the nearest hundredth.

1.  $3x^2 - 12 = 0$

$$\begin{array}{r} +12 \quad +12 \\ \hline 3x^2 = 12 \\ \hline \frac{3x^2}{3} = \frac{12}{3} \end{array}$$

$$\sqrt{x^2} = \sqrt{4}$$

$$x = \pm 2$$

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

$$\begin{array}{r} +60 \quad +60 \\ \hline 4x^2 = 60 \\ \hline \frac{4x^2}{4} = \frac{60}{4} \end{array}$$

$$\sqrt{x^2} = \sqrt{15}$$

$$x = \pm 3.87$$

3.  $3 \cdot \frac{d^2}{3} = 15 \cdot 3$

$$\sqrt{d^2} = \sqrt{45}$$

$$d = \pm 6.71$$

4.  $10 - 4g^2 = -11$

$$\begin{array}{r} -10 \quad -10 \\ \hline -4g^2 = -21 \\ \hline \frac{-4g^2}{-4} = \frac{-21}{-4} \end{array}$$

$$\sqrt{g^2} = \sqrt{5.25}$$

$$g = \pm 2.29$$

5.  $7q^2 + 35 = 14$

$$\begin{array}{r} -35 \quad -35 \\ \hline 7q^2 = -21 \\ \hline \frac{7q^2}{7} = \frac{-21}{7} \end{array}$$

$$\sqrt{q^2} = \sqrt{-3}$$

NO SOLUTION

6.  $3z^2 - 18 = -18$

$$\begin{array}{r} +18 \quad +18 \\ \hline 3z^2 = 0 \\ \hline \frac{3z^2}{3} = \frac{0}{3} \end{array}$$

$$\sqrt{z^2} = \sqrt{0}$$

$$z = 0$$

Solve. Express your answer in simplest radical form.

7.  $\frac{x^2}{2} + 6 = 13$

$$\begin{array}{r} -6 \quad -6 \\ \hline \frac{x^2}{2} = 7 \\ \hline \frac{x^2}{2} = 7 \cdot 2 \end{array}$$

$$\sqrt{x^2} = \sqrt{14}$$

$$x = \pm \sqrt{14}$$

8.  $14 - 2x^2 = 20$

$$\begin{array}{r} -14 \quad -14 \\ \hline -2x^2 = 6 \\ \hline \frac{-2x^2}{-2} = \frac{6}{-2} \end{array}$$

$$\sqrt{x^2} = \sqrt{-3}$$

No Solution

9.  $14 - k^2 = 2$

$$\begin{array}{r} -14 \quad -14 \\ \hline -k^2 = -12 \\ \hline \frac{-k^2}{-1} = \frac{-12}{-1} \end{array}$$

$$\sqrt{k^2} = \sqrt{12}$$

$$k = \pm \sqrt{12}$$

$$k = \pm \sqrt{4 \cdot 3}$$

$$k = \pm 2\sqrt{3}$$

10.  $53 = 8 + 9m^2$

$$\begin{array}{r} -8 \quad -8 \\ \hline 45 = 9m^2 \\ \hline \frac{45}{9} = \frac{9m^2}{9} \end{array}$$

$$\sqrt{5} = \sqrt{m^2}$$

$$\pm \sqrt{5} = m$$

$$m = \pm \sqrt{5}$$

11.  $3c^2 = 120$

$$\begin{array}{r} \frac{3c^2}{3} = \frac{120}{3} \\ \hline c^2 = 40 \end{array}$$

$$c = \pm \sqrt{40}$$

$$c = \pm \sqrt{4 \cdot 10}$$

$$c = \pm 2\sqrt{10}$$

12.  $4b^2 - 5 = 67$

$$\begin{array}{r} +5 \quad +5 \\ \hline 4b^2 = 72 \\ \hline \frac{4b^2}{4} = \frac{72}{4} \end{array}$$

$$\sqrt{b^2} = \sqrt{18}$$

$$b = \pm \sqrt{18}$$

$$b = \pm \sqrt{9 \cdot 2}$$

$$b = \pm 3\sqrt{2}$$

**Multiple Choice**

13. Which of the following is a solution of the equation  $61 - n^2 = -14$ ?

$$\begin{aligned}
 & \frac{-b}{-1} \pm \frac{\sqrt{b^2 - 4ac}}{-1} \\
 & \frac{-61}{-1} \pm \frac{\sqrt{61^2 - 4(-1)(-14)}}{-1} \\
 & \sqrt{61^2 - 4(-1)(-14)} \\
 & n = \pm \sqrt{75} \\
 & n = \pm \sqrt{25 \cdot 3} \\
 & n = \pm 5\sqrt{3}
 \end{aligned}$$

A. 75

B. -5

C.  $3\sqrt{5}$

D.  $-5\sqrt{3}$

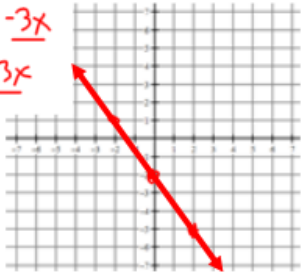
E. 37.5

**SKILLZ REVIEW**

**GRAPH**

1.  $3x + 2y = -6$

$$\begin{aligned}
 \frac{-3x}{2} &= \frac{-6-3x}{2} \\
 y &= -2 - \frac{3}{2}x
 \end{aligned}$$



**FACTOR**

2.  $x^2 - 49$

$$(x+7)(x-7)$$

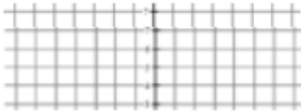
$$\begin{aligned}
 x &: -49 \\
 + &: 0
 \end{aligned}$$

**RADICALS**

3. Simplify

$$\begin{aligned}
 & \sqrt{32} \\
 & \sqrt{16 \cdot 2} \\
 & 4\sqrt{2}
 \end{aligned}$$

4.  $x = -2$



5.  $6x^2 + 19x - 7$

**TRY THESE!**

**IF YOU CAN'T GET THEM, WATCH THE SKILLZ REVIEW VIDEO FOR HELP!**

6. Simplify

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