

Solving for x by Taking Square Roots

Solve by using properties and taking the square root of both sides. Round all answers to the hundredths place.

1. $a^2 = 20$

$$\sqrt{a^2} = \sqrt{20}$$

$$a = \pm 4.47$$

$$a = 4.47$$

$$a = -4.47$$

2. $7x^2 = 84$

$$\frac{7x^2}{7} = \frac{84}{7}$$

$$x^2 = 12$$

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

$$x = \pm 3.46$$

$$x = 3.46$$

$$x = -3.46$$

3. $x^2 - 16 = 8$

$$\frac{x^2 - 16 + 16}{x^2} = \frac{8 + 16}{24}$$

$$x^2 = 24$$

$$\sqrt{x^2} = \sqrt{24}$$

$$x = \pm 4.90$$

$$x = 4.90$$

$$x = -4.90$$

4. $7y^2 + 18 = 4$

$$\frac{7y^2 + 18 - 18}{7y^2} = \frac{4 - 18}{-14}$$

$$7y^2 = -14$$

$$\frac{7y^2}{7} = \frac{-14}{7}$$

$$y^2 = -2$$

No Solution

5. $4x^2 - 200 = -20$

$$\frac{4x^2 - 200 + 200}{4x^2} = \frac{-20 + 200}{180}$$

$$4x^2 = 180$$

$$\frac{4x^2}{4} = \frac{180}{4}$$

$$x^2 = 45$$

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

$$x = \pm 6.71$$

$$x = 6.71$$

$$x = -6.71$$

6. $(x - 4)^2 = 25$

$$\sqrt{(x-4)^2} = \sqrt{25}$$

$$x - 4 = \pm 5$$

$$\frac{x - 4 = 5}{+4 \quad +4}$$

$$x = 9$$

$$\frac{x - 4 = -5}{+4 \quad +4}$$

$$x = -1$$

$$x = 9$$

$$x = -1$$

$$7. (4t + 1)^2 = 49$$

$$\sqrt{(4t+1)^2} = \sqrt{49}$$

$$4t+1 = \pm 7$$

$$4t+1=7$$

$$\begin{array}{r} -1 \quad -1 \\ \hline 4t = 6 \\ \frac{4t}{4} = \frac{6}{4} \end{array}$$

$$t = 1.5$$

$$4t+1=-7$$

$$\begin{array}{r} -1 \quad -1 \\ \hline 4t = -8 \\ \frac{4t}{4} = \frac{-8}{4} \end{array}$$

$$t = -2$$

$$8. (2x - 3)^2 = 81$$

$$\sqrt{(2x-3)^2} = \sqrt{81}$$

$$2x-3 = \pm 9$$

$$2x-3=9$$

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

$$x = 6$$

$$2x-3=-9$$

$$\begin{array}{r} +3 \quad +3 \\ \hline 2x = -6 \\ \frac{2x}{2} = \frac{-6}{2} \end{array}$$

$$x = -3$$

$$9. \frac{5(n+1)^2}{5} = \frac{40}{5}$$

$$(n+1)^2 = 8$$

$$\sqrt{(n+1)^2} = \sqrt{8}$$

$$n+1 = \pm 2.83$$

$$n+1=2.83$$

$$\begin{array}{r} -1 \quad -1 \\ \hline n = 1.83 \end{array}$$

$$n+1=-2.83$$

$$\begin{array}{r} -1 \quad -1 \\ \hline n = -3.83 \end{array}$$

$$10. \frac{3(x-2)^2}{3} = \frac{36}{3}$$

$$(x-2)^2 = 12$$

$$\sqrt{(x-2)^2} = \sqrt{12}$$

$$x-2 = \pm 3.46$$

$$x-2=3.46$$

$$\begin{array}{r} +2 \quad +2 \\ \hline x = 5.46 \end{array}$$

$$x-2=-3.46$$

$$\begin{array}{r} +2 \quad +2 \\ \hline x = -1.46 \end{array}$$

$$11. x^2 - 18x + 81 = 24$$

$$(x-9)^2 = 24$$

$$\sqrt{(x-9)^2} = \sqrt{24}$$

$$x-9 = \pm 4.90$$

$$x-9=4.90$$

$$\begin{array}{r} +9 \quad +9 \\ \hline x = 13.90 \end{array}$$

$$x-9=-4.90$$

$$\begin{array}{r} +9 \quad +9 \\ \hline x = 4.1 \end{array}$$

$$12. x^2 + 12x + 36 = 75$$

$$(x+6)^2 = 75$$

$$\sqrt{(x+6)^2} = \sqrt{75}$$

$$x+6 = \pm 8.66$$

$$x+6=8.66$$

$$\begin{array}{r} -6 \quad -6 \\ \hline x = 2.66 \end{array}$$

$$x+6=-8.66$$

$$\begin{array}{r} -6 \quad -6 \\ \hline x = -14.66 \end{array}$$

$$13. x^2 - 10x + 25 = 9$$

$$(x-5)^2 = 9$$

$$\sqrt{(x-5)^2} = \sqrt{9}$$

$$x-5 = \pm 3$$

$$x-5=3$$

$$\begin{array}{r} +5 \quad +5 \\ \hline x = 8 \end{array}$$

$$x-5=-3$$

$$\begin{array}{r} +5 \quad +5 \\ \hline x = 2 \end{array}$$

$$14. x^2 + 2x + 1 = 64$$

$$(x+1)^2 = 64$$

$$\sqrt{(x+1)^2} = \sqrt{64}$$

$$x+1 = \pm 8$$

$$x+1=8$$

$$\begin{array}{r} -1 \quad -1 \\ \hline x = 7 \end{array}$$

$$x+1=-8$$

$$\begin{array}{r} -1 \quad -1 \\ \hline x = -9 \end{array}$$