

## Using Radicals to Solve Equations

1.  $x(x + 4) - 3 = 4(x + 19.5)$

2. Find the positive value of  $x$  that makes the equation true, and then verify your solution is correct.

$$x^2 + 4x = 4(x + 16)$$

3.  $(9\sqrt{x})^2 - 43x = 76$

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## Using Radicals to Solve Equations

1.  $x(x + 4) - 3 = 4(x + 19.5)$

*Check:*

$$\begin{aligned} (x + 4) - 3 &= 4(x + 19.5) \\ x^2 + 4x - 3 &= 4x + 78 \\ x^2 + 4x - 4x - 3 &= 4x - 4x + 78 \\ x^2 - 3 &= 78 \\ x^2 - 3 + 3 &= 78 + 3 \\ x^2 &= 81 \\ \sqrt{x^2} &= \pm\sqrt{81} \\ x &= \pm 9 \end{aligned}$$

$$\begin{aligned} 9(9 + 4) - 3 &= 4(9 + 19.5) \\ 9(13) - 3 &= 4(28.5) \\ 117 - 3 &= 114 \\ 114 &= 114 \\ -9(-9 + 4) - 3 &= 4(-9 + 19.5) \\ -9(-5) - 3 &= 4(10.5) \\ 45 - 3 &= 42 \\ 42 &= 42 \end{aligned}$$

2. Find the positive value of  $x$  that makes the equation true, and then verify your solution is correct.

$$x^2 + 4x = 4(x + 16)$$

$$\begin{aligned} x^2 + 4x &= 4(x + 16) \\ x^2 + 4x &= 4x + 64 \\ x^2 + 4x - 4x &= 4x - 4x + 64 \\ x^2 &= 64 \\ \sqrt{x^2} &= \sqrt{64} \\ x &= 8 \end{aligned}$$

*Check:*

$$\begin{aligned} 8^2 + 4(8) &= 4(8 + 16) \\ 64 + 32 &= 4(24) \\ 96 &= 96 \end{aligned}$$

3.  $(9\sqrt{x})^2 - 43x = 76$

$$\begin{aligned} (9\sqrt{x})^2 - 43x &= 76 \\ 9^2(\sqrt{x})^2 - 43x &= 76 \\ 81x - 43x &= 76 \\ 38x &= 76 \\ \frac{38x}{38} &= \frac{76}{38} \\ x &= 2 \end{aligned}$$

*Check:*

$$\begin{aligned} (9(\sqrt{2}))^2 - 43(2) &= 76 \\ 9^2(\sqrt{2})^2 - 86 &= 76 \\ 81(2) - 86 &= 76 \\ 162 - 86 &= 76 \\ 76 &= 76 \end{aligned}$$

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