

## Using Radicals to Solve Equations

1.  $-3x^3 + 14 = -67$

2.  $216 + x = x(x^2 - 5) + 6x$

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

$$(4x)^3 = 1728$$

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## Using Radicals to Solve Equations

1.  $-3x^3 + 14 = -67$

$$\begin{aligned} -3x^3 + 14 &= -67 \\ -3x^3 + 14 - 14 &= -67 - 14 \\ -3x^3 &= -81 \\ \frac{-3x^3}{-3} &= \frac{-81}{-3} \\ x^3 &= 27 \\ \sqrt[3]{x^3} &= \sqrt[3]{27} \\ x &= 3 \end{aligned}$$

Check:

$$\begin{aligned} -3(3)^3 + 14 &= -67 \\ -3(27) + 14 &= -67 \\ -81 + 14 &= -67 \\ -67 &= -67 \end{aligned}$$

2.  $216 + x = x(x^2 - 5) + 6x$

$$\begin{aligned} 216 + x &= x(x^2 - 5) + 6x \\ 216 + x &= x^3 - 5x + 6x \\ 216 + x &= x^3 + x \\ 216 + x - x &= x^3 + x - x \\ 216 &= x^3 \\ \sqrt[3]{216} &= \sqrt[3]{x^3} \\ 6 &= x \end{aligned}$$

Check:

$$\begin{aligned} 216 + 6 &= 6(6^2 - 5) + 6(6) \\ 222 &= 6(31) + 36 \\ 222 &= 186 + 36 \\ 222 &= 222 \end{aligned}$$

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

$$(4x)^3 = 1728$$

$$\begin{aligned} (4x)^3 &= 1728 \\ 64x^3 &= 1728 \\ \frac{1}{64}(64x^3) &= (1728) \\ \frac{1}{64}x^3 &= 27 \\ \sqrt[3]{\frac{1}{64}x^3} &= \sqrt[3]{27} \\ x &= 3 \end{aligned}$$

Check:

$$\begin{aligned} (4(3))^3 &= 1728 \\ 12^3 &= 1728 \\ 1728 &= 1728 \end{aligned}$$

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