

6-5 Solving Square Root and other Radical Equations~**Get out your notebooks!****B.4 - Day 1****Objective** To solve square root and other radical equations**Essential Understanding** Solving a square root equation may require that you square each side of the equation. This can introduce extraneous solutions.

To solve a radical equation, isolate the radical on one side of the equation. Then raise each side to the power suggested by the index.

Ex. Solve for x.

$$3\sqrt{x} + 5 = 20$$

$$3\sqrt{x} = 15$$

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

$$x = 25$$

$$\frac{6}{-6} - 4\sqrt{x} = \frac{-18}{-6}$$

$$\frac{-4\sqrt{x}}{-4} = \frac{-24}{-4}$$

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

$$x = 36$$

Jan 9-2:20 PM

Problem 1 Solving a Square Root EquationWhat is the solution of $3 + \sqrt{2x - 3} = 8$?

$$(\sqrt{2x-3})^2 = (5)^2$$

$$2x - 3 = 25$$

$$2x = 28$$

$$x = 14$$

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Problem 2 Solving Other Radical Equations**What does this mean?**

$$(7v - 3)^{\frac{1}{2}} + 2 = 7$$

$$\sqrt{7v - 3} + 2 = 7$$

$$(\sqrt{7v - 3})^2 = (5)^2$$

$$7v - 3 = 25$$

$$7v = 28$$

$$\boxed{v = 4}$$

Rational Exponent Rule:

$$a^{\frac{m}{n}} = \sqrt[n]{a^m} \quad \text{OR} \quad (\sqrt[n]{a})^m$$

Ex. $36^{\frac{1}{2}} = \sqrt[2]{36} = 6$

$125^{\frac{1}{3}} = \sqrt[3]{125} = 5$

$x^{\frac{3}{4}} = \sqrt[4]{x^3}$

$27^{\frac{2}{3}} = (\sqrt[3]{27})^2$
 $= (3)^2$
 $= 9$

Jan 17-10:07 AM

Problem 2 Solving Other Radical Equations

What is the solution of $3(x + 1)^{\frac{2}{3}} = 12$

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Problem 2 Solving Other Radical Equations

What is the solution of $3\sqrt[5]{(x+1)^3} + 1 = 25$?

$$\frac{3\sqrt[5]{(x+1)^3}}{3} = \frac{24}{3}$$

$$\left(\sqrt[5]{(x+1)^3}\right)^5 = (8)^5$$

$$\sqrt[3]{(x+1)^3} = \sqrt[3]{32768}$$

$$x+1 = 32, \quad \boxed{x=31}$$

$$\begin{array}{cc} -1 & -1 \\ \hline & \end{array}$$

$$\left((x+1)^{\frac{3}{5}}\right)^{\frac{5}{3}} = (8)^{\frac{5}{3}}$$

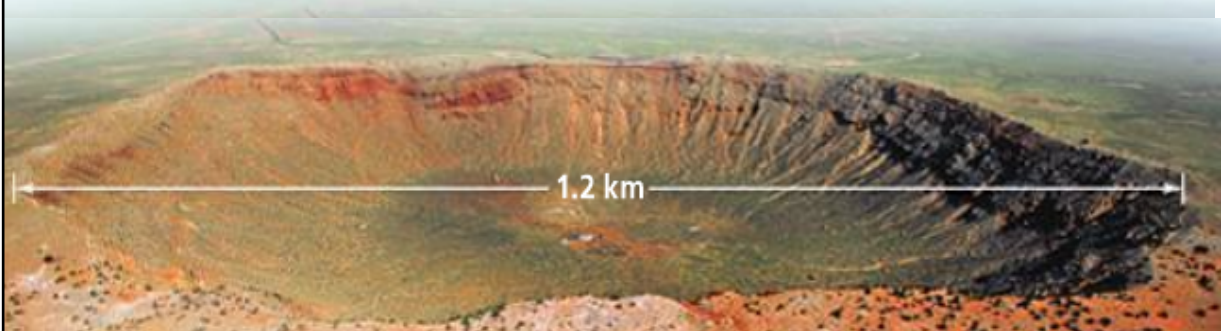
$$x+1 = 32$$

$$\boxed{x=31}$$

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Problem 3 Using Radical Equations **STEM**

Earth Science For Meteor Crater in Arizona, the formula $d = 2\sqrt[3]{\frac{V}{0.3}}$ relates the diameter d of the rim (in meters) to the volume V (in cubic meters). What is the volume of Meteor Crater? (All values are approximate.)



$$1200 = 2\sqrt[3]{\frac{V}{0.3}}$$

$$(600)^3 = \left(\sqrt[3]{\frac{V}{0.3}}\right)^3$$

$$216\,000\,000 = \frac{V}{0.3} \cdot 0.3$$

$$\boxed{64,800,000 \text{ m}^3}$$

Mar 18-1:33 PM

HW: p.395: Day 1
#s: 9 - 25 all, 60

Feb 5-7:33 AM