

8.8 Radical Equations continued.....page

Goal: Solving Equations with Rational Exponents.

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Review from yesterday:

$$1. \sqrt[3]{3x-4} = 2 \quad \begin{array}{l} 3 \quad 3 \\ 3x-4 = 8 \\ +4 \quad +4 \\ 3x = 12 \\ x = 4 \end{array}$$

$$2. \sqrt[3]{3x-4} = 2 \quad \begin{array}{l} 3 \quad 3 \\ 3x-4 = 8 \\ +4 \quad +4 \\ 3x = 12 \\ x = 4 \end{array}$$

$$4 + \sqrt{x-1} = 5 \quad \begin{array}{l} 4 + \sqrt{x-1} = 5 \\ -4 \quad -4 \\ \sqrt{x-1} = 1 \\ \sqrt{x-1}^2 = 1^2 \\ x-1 = 1 \\ +1 \quad +1 \\ x = 2 \end{array}$$

$$4 + \sqrt{x-1} = 5 \quad \begin{array}{l} 4 + \sqrt{x-1} = 5 \\ -4 \quad -4 \\ \sqrt{x-1} = 1 \\ \sqrt{x-1}^2 = 1^2 \\ x-1 = 1 \\ +1 \quad +1 \\ x = 2 \end{array}$$

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Check for extraneous solutions.

$$3. \sqrt{8x+6} = (3\sqrt{x})^2 \quad \begin{array}{l} \sqrt{8x+6} = 3\sqrt{6} \\ 8x+6 = 9x \\ -8x \quad -8x \\ x = 6 \end{array}$$

$$4. \sqrt{-3x+33} = (5-x)^2 \quad \begin{array}{l} \sqrt{-3x+33} = (5-x)^2 \\ -3x+33 = 25-10x+x^2 \\ 0 = x^2-7x-8 \\ (x-8)(x+1) \\ x = 8, x = -1 \end{array}$$

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Remember! To find a power, multiply the exponents.

$$\sqrt{x+12}^{\frac{1}{2} \cdot 2}$$

What is a $\frac{1}{3}$ power the same as?

$$5. (5x+7)^{\frac{1}{3}} = 3 \quad \begin{array}{l} 5x+7 = 27 \\ 5x = 20 \\ x = 4 \end{array}$$

$$6. (2x)^2 = (4x+8)^{\frac{1}{2}} \quad \begin{array}{l} 4x^2 = 4x+8 \\ 4x^2-4x-8=0 \\ 4(x^2-x-2)=0 \\ 4(x-2)(x+1) \\ x = 2, x = -1 \end{array}$$

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Did you check for extraneous solutions?

$$7. (x+5)^{\frac{1}{3}} = 3$$

$$8. (2x+15)^{\frac{1}{2}} = x$$

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