Lesson 6.5 Solving Square Roots & Other
Radical Equations (Clickers)

<u>Essential Understanding:</u> Solving a square root equation may require that you square each side of the eqution. This can introduce extraneous solutions.

A <u>radical equation</u> is an equation that has a variable in a radicand or a variable with a rational exponent.

Ex. What is the solution of $3 + \sqrt{2x - 3} = 8'$?

When solving an equation of the form $x^{m/n}$, raise each side of the equation to the power n/m, the reciprocal of m/n. When m or n is even, then $(x^{m/n})^{n/m} = |x|$.

Ex. What is the solution of $3(x + 1)^{2/3} = 12$?

Ex. Solve: $3\sqrt[5]{(x + 1)^3} + 1 = 25$

Ex. Solve: $(x + 2)^{2/3} = 9$

1 Solve:

$$\sqrt{x+4} + 6 = 7$$

2 Solve:

$$-\sqrt[3]{x} + 3 = 0$$

3 Solve:

$$(x+5)^{\frac{2}{3}} = 4$$

Ex. What is the solution of $\sqrt{x + 7} - 5 = x$? Check for extraneous solutions.

Ex. What is the solution of $\sqrt{5x - 1} + 3 = x$?

*When there are multiple radicals, isolate the more complicated one first.

Ex. What is the solution of $\sqrt{2x + 1} - \sqrt{x} = 1$?

Ex. What is the solution of $\sqrt{5x + 4} - \sqrt{x} = 4$?

4 Solve:

$$\sqrt{3x+7} = x-1$$

5 Solve:

$$\sqrt{5-x} - \sqrt{x} = 1$$

Ex. For Meteor Crate 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 that has as diameter of 1.2 km?