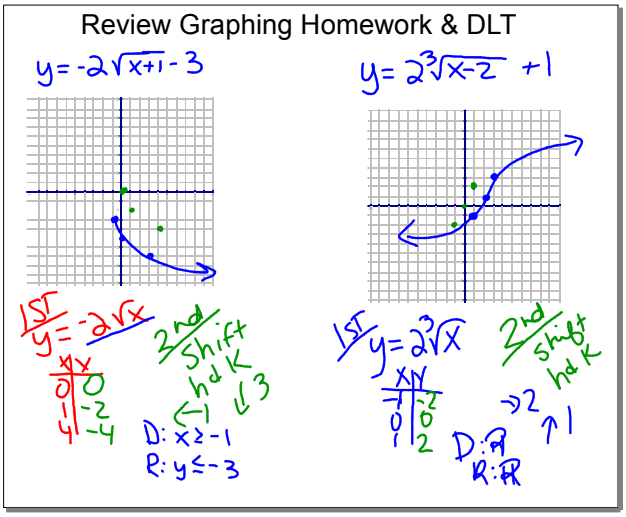

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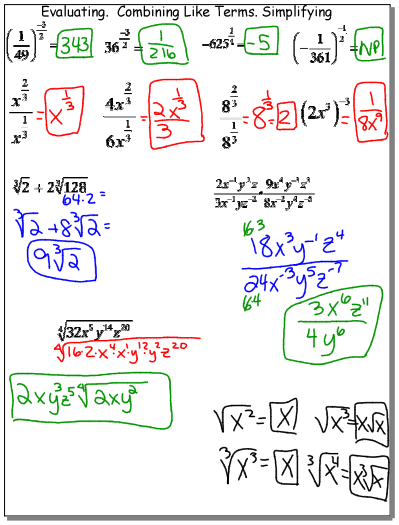

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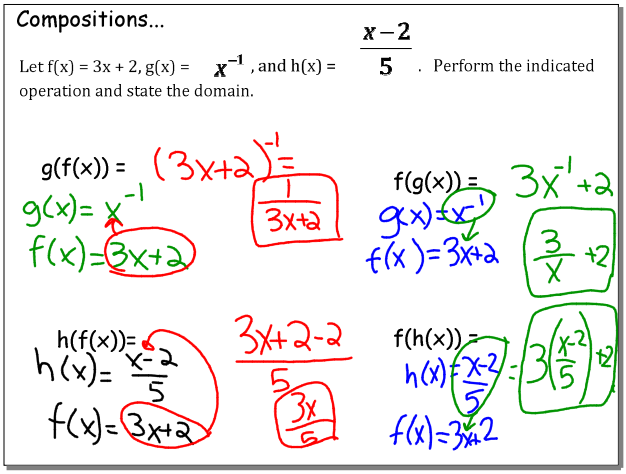

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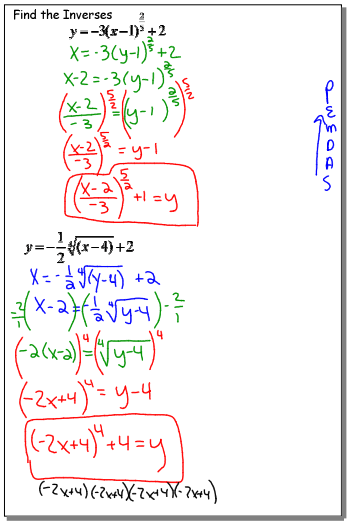

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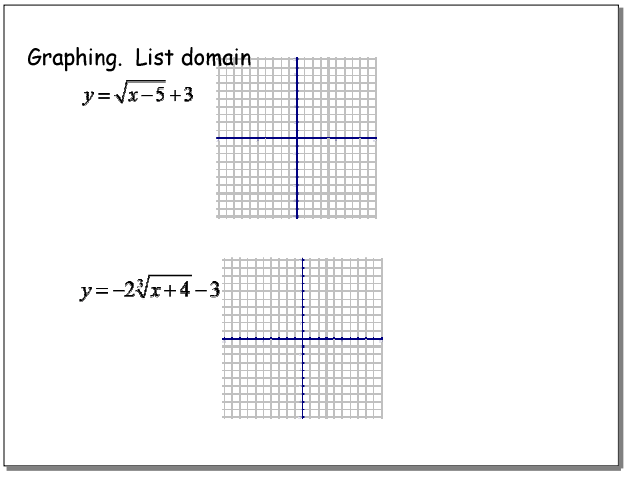

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6.6 Solve Radical Equations

ISOLATE YOUR VARIABLE

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Solve the equation. Check your solution.

1. $\sqrt[3]{x} - 9 = -1$
2. $\sqrt{x+25} = 4$
3. $2\sqrt[3]{x-3} = 4$

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2nd Type Solve an equation with a rational exponent

Solve $(x+2)^{3/4} - 1 = 7$.

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3. Solve an equation with one radical

Solve $x + 1 = \sqrt{7x+15}$.

Extraneous Solution - Doesn't work in equation

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Solving Practice

1. $3\sqrt{4-3x} = 21$
2. $(2x-3)^{1/2} + 2 = 2$
3. $2(x-1)^{1/2} - 3 = 7$
4. $\sqrt[3]{2x+7} = 5$
5. $\sqrt[3]{x} + 1 = -2$
6. $(x+4)^{1/3} - 2 = -6$

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1. $(2x+12)^{2/3} - 3 = 13$
2. $-2\sqrt[3]{2x+5} + 7 = 15$
3. $\sqrt{x+3} = \sqrt{4x-8}$
4. $(3x+21)^{4/3} + 9 = 90$

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EXAMPLE 2 **Solve a radical equation given a function**

WIND VELOCITY In a hurricane, the mean sustained wind velocity v (in meters per second) is given by

$$v(p) = 6.3\sqrt{1013 - p}$$

where p is the air pressure (in millibars) at the center of the hurricane. Estimate the air pressure at the center of a hurricane when the mean sustained wind velocity is 54.5 meters per second.

Solution

$v(p) = 6.3\sqrt{1013 - p}$	Write given function.
$54.5 = 6.3\sqrt{1013 - p}$	Substitute 54.5 for $v(p)$.
$8.65 \approx \sqrt{1013 - p}$	Divide each side by 6.3.
$(8.65)^2 \approx (\sqrt{1013 - p})^2$	Square each side.
$74.8 \approx 1013 - p$	Simplify.
$-938.2 \approx -p$	Subtract 1013 from each side.
$938.2 \approx p$	Divide each side by -1.

▸ The air pressure at the center of the hurricane is about 938 millibars

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