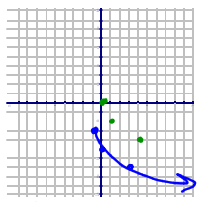
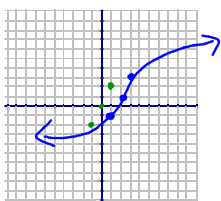


Review Graphing Homework & DLT

$y = -2\sqrt{x+1} - 3$ 


1st  $y = -2\sqrt{x}$   
 $\frac{0}{4} = \frac{0}{-4}$   
 $\frac{-1}{4} = \frac{-2}{-4}$

2nd Shift  
 h: -1  
 k: -3  
 D:  $x \geq -1$   
 R:  $y \leq -3$

$y = 2\sqrt{x-2} + 1$ 


1st  $y = 2\sqrt{x}$   
 $\frac{0}{1} = \frac{0}{2}$   
 $\frac{1}{1} = \frac{2}{2}$

2nd Shift  
 h: 2  
 k: 1  
 D:  $x \geq 2$   
 R:  $y \geq 1$

Jan 26-8:00 AM

Evaluating. Combining Like Terms. Simplifying

$$\left(\frac{1}{49}\right)^{\frac{1}{2}} = \frac{1}{\sqrt{49}} = \frac{1}{7}$$

$$36^{\frac{1}{2}} = \sqrt{36} = 6$$

$$-625^{\frac{1}{3}} = -\sqrt[3]{625} = -5$$

$$\left(-\frac{1}{361}\right)^{\frac{1}{2}} = \sqrt{-\frac{1}{361}} = \text{NPI}$$

$$\frac{x^{\frac{2}{3}}}{x^{\frac{1}{3}}} = x^{\frac{2}{3}-\frac{1}{3}} = x^{\frac{1}{3}}$$

$$\frac{4x^{\frac{2}{3}}}{6x^{\frac{1}{3}}} = \frac{2x^{\frac{2}{3}}}{3x^{\frac{1}{3}}}$$

$$\frac{8^{\frac{2}{3}}}{8^{\frac{1}{3}}} = 8^{\frac{2}{3}-\frac{1}{3}} = 8^{\frac{1}{3}} = \sqrt[3]{8} = 2$$

$$(2x^{\frac{1}{3}})^{\frac{3}{2}} = \frac{1}{8x^{\frac{1}{2}}}$$

$$\sqrt{2} + 2\sqrt[3]{128} = \sqrt{2} + 8\sqrt[3]{2} = \frac{9\sqrt[3]{2}}{\sqrt{2}}$$

$$\frac{2x^{-1}y^2z^3 + 9x^4y^{-1}z^5}{3x^{-1}y^2z^4 + 8x^{-2}y^3z^{-4}}$$

$$\frac{18x^3y^{-1}z^4}{24x^{-3}y^5z^{-7}} = \frac{3x^{10}z^{11}}{4y^6}$$

$$\sqrt[3]{32x^5y^4z^{20}} = \sqrt[3]{16 \cdot 2 \cdot x^3 \cdot x^2 \cdot y^3 \cdot y \cdot z^{18} \cdot z^2} = 2xy^3z^6\sqrt[3]{2x^2y^1z^2}$$

$$\sqrt{x^2} = |x| \quad \sqrt{x^2} = \sqrt{x} \sqrt{x}$$

$$\sqrt[3]{x^3} = |x| \quad \sqrt[3]{x^3} = \sqrt[3]{x} \sqrt[3]{x} \sqrt[3]{x}$$

Jan 30-7:16 PM



Jan 26-1:15 PM

Compositions...

Let  $f(x) = 3x + 2$ ,  $g(x) = x^{-1}$ , and  $h(x) = \frac{x-2}{5}$ . Perform the indicated operation and state the domain.

$$g(f(x)) = (3x+2)^{-1} = \frac{1}{3x+2}$$

$$f(g(x)) = 3x^{-1} + 2 = \frac{3}{x} + 2$$

$$h(f(x)) = \frac{3x+2-2}{5} = \frac{3x}{5}$$

$$f(h(x)) = 3\left(\frac{x-2}{5}\right) + 2 = \frac{3(x-2)}{5} + 2$$

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Find the Inverses

$$y = -3(x-1)^2 + 2$$

$$x - 2 = -3(y-1)^2 + 2$$

$$x - 2 - 2 = -3(y-1)^2$$

$$\left(\frac{x-2}{-3}\right)^{\frac{1}{2}} = (y-1)^{\frac{1}{2}}$$

$$\left(\frac{x-2}{-3}\right)^{\frac{1}{2}} = y - 1$$

$$\left(\frac{x-2}{-3}\right)^{\frac{1}{2}} + 1 = y$$

Domain

$$y = \frac{1}{2}(x-4)^2 + 2$$

$$x - 2 = \frac{1}{2}(y-4)^2 + 2$$

$$\left(\frac{x-2}{2}\right)^{\frac{1}{2}} = \left(\frac{1}{2}(y-4)\right)^{\frac{1}{2}}$$

$$(-2(x-2))^{\frac{1}{2}} = (\sqrt{y-4})^{\frac{1}{2}}$$

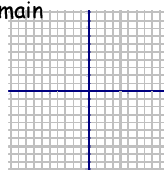
$$(-2x+4)^{\frac{1}{2}} = y - 4$$

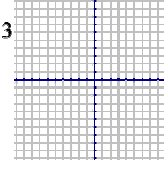
$$(-2x+4)^{\frac{1}{2}} + 4 = y$$

$$(-2x+4)(-2x+4)(-2x+4)(-2x+4)$$

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Graphing. List domain

$$y = \sqrt{x-5} + 3$$


$$y = -2\sqrt[3]{x+4} - 3$$


Jan 26-12:08 PM

## 6.6 Solve Radical Equations

ISOLATE YOUR VARIABLE

Feb 5-2:54 PM

Solve the equation. Check your solution.

- $\sqrt[3]{x} - 9 = -1$   
 $\sqrt[3]{x} - 9 = -1$   
 $\quad +9 \quad +9$   
 $(\sqrt[3]{x})^3 = (8)^3$   
 $x = 512$   
 $8 \cdot 8 \cdot 8 = 64$   
 $\quad \quad \quad \frac{8}{512}$
- $\sqrt{x+25} = 4$   
 $(\sqrt{x+25})^2 = (4)^2$   
 $x+25 = 16$   
 $x = -9$
- $2\sqrt[3]{x-3} = 4$   
 $\frac{2\sqrt[3]{x-3}}{2} = \frac{4}{2}$   
 $\sqrt[3]{x-3} = (2)^3$   
 $x-3 = 8$   
 $x = 11$

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2nd Type Solve an equation with a rational exponent

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

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

$$\left((x+2)^{3/4}\right)^{4/3} = (8)^{4/3}$$

$$x+2 = 16$$

$$x = 14$$

Feb 5-2:58 PM

3. Solve an equation with one radical

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

$$(x+1)^2 = (\sqrt{7x+15})^2$$

$$(x+1)(x+1) = 7x+15$$

$$x^2 + 2x + 1 = 7x + 15$$

$$x^2 - 5x - 14 = 0$$

$$(x-7)(x+2) = 0$$

$x = 7$     $x = -2$    **WAIT!**

$\hookrightarrow$  Extraneous Solution - Doesn't work in equation

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Solving Practice

- $3\sqrt{4-3x} = 21$   
 $(\sqrt{4-3x})^2 = (7)^2$   
 $4-3x = 49$   
 $-3x = 45$   
 $x = -15$
- $(2x-3)^{1/2} + 2 = 2$   
 $(2x-3)^{1/2} = (0)^2$   
 $2x-3 = 0$   
 $x = \frac{3}{2}$
- $2(x-1)^{1/2} - 3 = 7$   
 $+3 \quad +3$   
 $2(x-1)^{1/2} = 10$   
 $(x-1)^{1/2} = (5)^2$   
 $x-1 = 25$     $x = 26$
- $\sqrt[3]{2x+7} = 5$   
 $(\sqrt[3]{2x+7})^3 = (5)^3$   
 $2x+7 = 125$   
 $2x = 118$   
 $x = 59$
- $\sqrt[3]{x+1} = -2$   
 $(\sqrt[3]{x+1})^3 = (-2)^3$   
 $x+1 = -8$   
 $x = -9$
- $(x+4)^{1/3} - 2 = -5$   
 $(x+4)^{1/3} = (-4)^3$   
 $x+4 = -64$   
 $x = -68$

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$$(2x+12)^{2/3} - 3 = 13$$

$$\left(\sqrt[3]{2x+12}\right)^2 = (16)^{3/2}$$

$$2x+12 = 64$$

$$2x = 52$$

$$x = 26$$
  

$$(\sqrt{x+3}) = (\sqrt{4x-8})$$

$$x+3 = 4x-8$$

$$\frac{11}{3} = 3x$$

$$\frac{11}{9} = x$$
  

$$-2\sqrt[3]{2x+5} + 7 = 15$$

$$-2\sqrt[3]{2x+5} = 8$$

$$\left(\sqrt[3]{2x+5}\right)^3 = (-4)^3$$

$$2x+5 = -64$$

$$2x = -69$$

$$x = -\frac{69}{2}$$
  

$$(3x+21)^{4/3} + 9 = 90$$

$$\left(\sqrt[3]{3x+21}\right)^4 = (81)^{3/4}$$

$$3x+21 = 27$$

$$3x = 6$$

$$x = 2$$

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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**

$$v(p) = 6.3\sqrt{1013 - p} \quad \text{Write given function.}$$

$$54.5 = 6.3\sqrt{1013 - p} \quad \text{Substitute 54.5 for } v(p).$$

$$8.65 \approx \sqrt{1013 - p} \quad \text{Divide each side by 6.3.}$$

$$(8.65)^2 \approx (\sqrt{1013 - p})^2 \quad \text{Square each side.}$$

$$74.8 \approx 1013 - p \quad \text{Simplify.}$$

$$-938.2 \approx -p \quad \text{Subtract 1013 from each side.}$$

$$938.2 \approx p \quad \text{Divide each side by } -1.$$

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

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