Review: 10.1 – 10.3

Board Races!!!!

No calculators!!!!

Simplify each expression completely.

$$\left(\sqrt{3}\right)\left(15^{\frac{1}{2}}\right)$$

$$\sqrt{3} \cdot \sqrt{15}$$

$$\sqrt{3} \cdot \sqrt{3 \cdot 5}$$

$$3\sqrt{5}$$

$$4^{\frac{5}{2}} * 9^{-\frac{1}{2}}$$

$$\left(\sqrt{4}\right)^5 \cdot \frac{1}{\sqrt{9}}$$

$$2^5 \cdot \frac{1}{3}$$

$$32 \cdot \frac{1}{3} = \frac{32}{3}$$

$$\left(2^{\frac{2}{3}}\right)^6$$

$$2^{\frac{2}{3} \cdot 6} = 2^4 = 16$$

$$36^{-\frac{1}{2}} - 64^{-\frac{1}{3}}$$

$$\frac{1}{\sqrt{36}} - \frac{1}{\sqrt[3]{64}}$$

$$\frac{1}{6} - \frac{1}{4}$$

$$\frac{2}{12} - \frac{3}{12} = -\frac{1}{12}$$

$$\left(7^{\frac{1}{2}} + 5^{\frac{1}{2}}\right)\left(7^{\frac{1}{2}} - 5^{\frac{1}{2}}\right)$$

$$\left(\sqrt{7} + \sqrt{5}\right)\left(\sqrt{7} - \sqrt{5}\right)$$

$$\sqrt{7} \cdot \sqrt{7} - \sqrt{5} \cdot \sqrt{5}$$

$$7 - 5$$

$$2$$

$16^{0.25}$

$16^{\frac{1}{4}} = \sqrt[4]{16} = 2$

$25^{-1.5}$

$25^{-3/2} = \frac{1}{(\sqrt{25})^3}$

$= \frac{1}{5^3} = \frac{1}{125}$

$7^{1.6} * 49^{0.2}$

$7^{1.6} \cdot (7^2)^{0.2}$

$7^{1.6} \cdot 7^{0.4}$

$7^{1.6+0.4} = 7^2 = 49$

Write in exponential form.

$\sqrt[6]{64x^{12}y^8}$

$2 \cdot x^{12/6} \cdot y^{8/6}$

$2x^2y^{4/3}$

$64 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

Write in exponential form.

$\sqrt[3]{x^2} * \sqrt[4]{x}$

$x^{2/3} \cdot x^{1/4} = x^{2/3 + 1/4} = x^{\frac{11}{12}}$

$\frac{2}{3} + \frac{1}{4} = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}$

Solve each of the following equations.

$$4^{x^2} = 16$$

$$4^{x^2} = 4^2$$

$$x^2 = 2$$

$$x = \pm\sqrt{2}$$

$$27^x = \frac{1}{9}$$

$$(3^3)^x = 3^{-2}$$

$$3^{3x} = 3^{-2}$$

$$3x = -2$$

$$x = -2/3$$

$$5^x = 1$$

$$5^x = 5^0$$

$$x = 0$$

$$x^{\frac{3}{4}} = 8$$

$$\left(\sqrt[4]{x}\right)^3 = 8$$

$$\sqrt[4]{x} = 2$$

$$x = 2^4$$

$$x = 16$$

$$x^{\frac{4}{3}} = 625$$

$$\left(\sqrt[3]{x}\right)^4 = 625$$

$$\sqrt[3]{x} = \pm 5$$

$$x = \pm 125$$

5 | 625
5 | 125
5 | 25
5

$$\left(\frac{4}{9}\right)^{4x} = \frac{27}{8}$$

$$\left(\left(\frac{2}{3}\right)^2\right)^{4x} = \left(\frac{2}{3}\right)^{-3}$$

$$\left(\frac{2}{3}\right)^{8x} = \left(\frac{2}{3}\right)^{-3}$$

$$8x = -3$$

$$x = -3/8$$

Let $f(x)=2x+4$ and $g(x)=\sqrt{x^2-4}$.

Find f(g(2).

$g(2)=\sqrt{4-4}=0$

$f(0)=0+4=4$

Let $f(x)=2x+4$ and $g(x)=\sqrt{x^2-4}$.

Find g(f(0)).

$f(0)=0+4=4$

$g(4)=\sqrt{16-4}=\sqrt{12}=2\sqrt{3}$

Let $f(x)=2x+4$ and $g(x)=\sqrt{x^2-4}$.

Find f(f(-2)).

$f(-2) = -4+4 = 0$

$f(0) = 0+4 = 4$

Let $f(x)=2x+4$ and $g(x)=\sqrt{x^2-4}$.

Find x so that f(x) = 12.

$12 = 2x+4$

$8 = 2x$

$4 = x$

Let $f(x)=2x+4$ and $g(x)=\sqrt{x^2-4}$.

Find $f^{-1}(x)$.

$y = 2x + 4$

Inverse: $x = 2y + 4$

$x - 4 = 2y$

$\frac{x-4}{2} = y$

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

If (2, 4) is on the graph of y = f(x), what point is on the graph of the inverse of f?

(4, 2)

Inverse trades places for x & y