

Quotient Property of Radicals

- Rationalizing The Denominator
- Conjugates

Recap.

$$\sqrt{2} \cdot \sqrt{5} = \sqrt{10}$$

Product Prop.

$$\sqrt{\frac{a}{b}} \Rightarrow \frac{\sqrt{a}}{\sqrt{b}}$$

$$\sqrt{\frac{16}{2}} = \frac{\sqrt{16}}{\sqrt{2}} = \frac{4}{\sqrt{2}} \text{ wait!} = \frac{4\sqrt{2}}{2}$$

$$\sqrt{\frac{16}{4}} \Rightarrow \frac{\sqrt{16}}{\sqrt{4}} = \frac{4}{2} = 2 \Rightarrow 2\sqrt{2}$$

Rationalize The Denominator

$$\frac{4}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \rightarrow \frac{4\sqrt{2}}{2} \rightarrow 2\sqrt{2}$$

Conjugates

$$\frac{3\sqrt{2}}{2+\sqrt{3}} \cdot \frac{2-\sqrt{3}}{2-\sqrt{3}} = \frac{3\sqrt{2}(2-\sqrt{3})}{(2+\sqrt{3})(2-\sqrt{3})}$$

~~$(2+\sqrt{3})(2+\sqrt{3})$~~   
 ~~$4 + 2\sqrt{3} + 2\sqrt{3} + 3$~~   
 ~~$7 + 4\sqrt{3}$~~

$$(2+\sqrt{3})(2-\sqrt{3}) = 4 - 2\sqrt{3} + 2\sqrt{3} - 3 = 1$$

$$\frac{3\sqrt{2}(2-\sqrt{3})}{1} = 6\sqrt{2} - 3\sqrt{6}$$

$$\sqrt{\frac{2}{5}} + \sqrt{40} + \sqrt{10}$$

$$\frac{\sqrt{2}}{\sqrt{5}} + \frac{\sqrt{40}}{\sqrt{5}} + \frac{\sqrt{10}}{\sqrt{5}} = \frac{\sqrt{2}}{\sqrt{5}} + \frac{2\sqrt{10}}{\sqrt{5}} + \frac{\sqrt{10}}{\sqrt{5}} = \frac{\sqrt{2}}{\sqrt{5}} + \frac{3\sqrt{10}}{\sqrt{5}}$$

$$\sqrt{\frac{2}{5}} + \sqrt{40} + \sqrt{10}$$

$$\frac{\sqrt{10}}{\sqrt{5}} + \frac{\sqrt{40}}{1} + \frac{\sqrt{10}}{1}$$

$$\frac{5\sqrt{10}}{5} + \frac{\sqrt{10}}{5} + \frac{5\sqrt{40}}{5}$$

$$x = \sqrt{10}$$

$$\frac{6\sqrt{10}}{5} + \frac{5\sqrt{40}}{5}$$

$$\frac{6x}{5} = \frac{6\sqrt{10}}{5}$$

$$\frac{6\sqrt{10} + 5\sqrt{40}}{5}$$

$$\frac{6\sqrt{10} + 5\sqrt{4}\sqrt{10}}{5}$$

$$\frac{6\sqrt{10} + 10\sqrt{10}}{5} = \frac{16\sqrt{10}}{5}$$

$$\frac{6\sqrt{10} + 5\sqrt{40}}{5}$$

$$\Rightarrow \frac{6\sqrt{10} + 5 \cdot \sqrt{4} \cdot \sqrt{10}}{5}$$

$\begin{matrix} 5 \cdot 2 \\ \hline 10 \end{matrix}$

$$\frac{6\sqrt{10} + 10\sqrt{10}}{5}$$

$$\sqrt{\frac{x+1}{x-1}} = \frac{\sqrt{x+1}}{\sqrt{x-1}} \cdot \frac{\sqrt{x-1}}{\sqrt{x-1}}$$

$$\frac{\sqrt{x^2-1}}{x-1} \quad \begin{array}{l} (x+1)(x-1) \\ x^2 \end{array} \quad \begin{array}{l} (x-1) \\ (x+1) \end{array}$$

$$\frac{-4+\sqrt{3}}{-1-2\sqrt{5}} \cdot \frac{-1+2\sqrt{5}}{-1+2\sqrt{5}} = \frac{4-8\sqrt{5}-\sqrt{3}+2\sqrt{15}}{-19}$$

$$(-4+\sqrt{3})(-1+2\sqrt{5})$$

$$4-8\sqrt{5}-\sqrt{3}+2\sqrt{15}$$

$$\frac{-4+8\sqrt{5}+\sqrt{3}-2\sqrt{15}}{19}$$

$$\frac{3}{-4k^2-5\sqrt{k^4}} = \frac{3}{-4k^2-5k^2} = \frac{3}{-9k^2} = -\frac{1}{3k^2}$$