

Conjugates:

- used to get rid of square roots if there is more than one terms

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

$$(1+\sqrt{3}) \xleftrightarrow{\text{conjugates}} (1-\sqrt{3})$$

$$(a+b)(a-b) = a^2 - b^2$$

$$\begin{aligned} (1+\sqrt{3})(1-\sqrt{3}) &= 1 - \sqrt{3} + \sqrt{3} - \sqrt{9} \\ &= 1 - 3 = -2 \end{aligned}$$

$$(5 - \sqrt{2})(5 + \sqrt{2})$$

$$5^2 - (\sqrt{2})^2 = 25 - 2 = 23$$

$$(5 - \sqrt{2})(5 + \sqrt{2})$$

$$25 + 5\sqrt{2} - 5\sqrt{2} - \sqrt{2}$$

$$25 - 2 = 23$$

$$\frac{(3-\sqrt{5})}{(3+\sqrt{5})(3-\sqrt{5})} = \frac{21-7\sqrt{5}}{4}$$
$$9 - (\sqrt{5})^2 = 9 - 5$$

$$\frac{(-2-\sqrt{3})(4+\sqrt{5})}{(4-\sqrt{5})(4+\sqrt{5})} = \frac{8-2\sqrt{5}-4\sqrt{3}-\sqrt{15}}{11}$$
$$16-5$$

Rational (Fraction) Exponents:

$$b^{\frac{n}{m}}$$

power \rightarrow $\frac{n}{m}$ \leftarrow index

$$\sqrt[m]{b^n}$$

Change to Radical Form

$$X^{\frac{2}{3}} = \sqrt[3]{X^2} \approx (\sqrt[3]{X})^2 \text{ or } (\sqrt[m]{b})^n$$

flips it over \rightarrow

$$a^{\frac{1}{5}} = \sqrt[5]{a} = \frac{1}{\sqrt[5]{a}}$$
$$y^{\frac{3}{4}} = \frac{1}{\sqrt[4]{y^3}}$$

Change to exponent form!

$$\sqrt[3]{b} =$$

$$b^{\frac{1}{3}}$$

$$\frac{1}{\sqrt{x}} =$$

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

Rational Exponents let us do things with radicals that have different indexes.

$$\begin{aligned} \sqrt[3]{x} \cdot \sqrt[6]{x} &= x^{\frac{1}{3}} \cdot x^{\frac{1}{6}} \\ &= x^{\frac{1}{2}} \\ &= \sqrt{x} \end{aligned}$$
$$\begin{aligned} &= x^{\frac{2}{3} + \frac{1}{6}} \cdot x^{\frac{1}{6}} \\ &= x^{\frac{4}{6} + \frac{1}{6}} = x^{\frac{5}{6}} = x^{\frac{5}{6}} \end{aligned}$$

$$\frac{x^{515}}{x^{515}} = x^{515-515} = x^0$$

$$\frac{\sqrt[5]{x^4}}{\sqrt[5]{x}} = \sqrt[5]{\frac{x^4}{x}} = \sqrt[5]{x^3}$$

power to a power:
multiply the
exponents

$$\left(x^{\frac{1}{4}}\right)^{\frac{2}{3}} = x^{\frac{1}{4} \cdot \frac{2}{3}} = x^{\frac{2}{12}} = x^{\frac{1}{6}}$$

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

$$\omega^{-5/2} = \frac{1}{\omega^{5/2}} \cdot \omega^{5/2} = \frac{1}{\sqrt[5]{\omega^2} \cdot \sqrt[5]{\omega^3}} \cdot \omega^{5/2} = \frac{1}{\sqrt[5]{\omega^5}} \cdot \omega^{5/2} = \frac{\omega^{5/2}}{\omega}$$
$$\frac{1}{\sqrt[5]{\omega^2} \cdot \sqrt[5]{\omega^3}} = \frac{\sqrt[5]{\omega^3}}{\sqrt[5]{\omega^5}} = \frac{\sqrt[5]{\omega^3}}{\omega}$$

$8^{2/3}$ ← power of answer
 ← size of groups
 8



$$(2)^2 = 4$$



$$(32)^{3/5}$$

$$= \frac{1}{32^{3/5}} = \frac{1}{2^3}$$

$$= \frac{1}{8}$$

254: 43-46 ALL
261: 21-32 ALL
42-50 Events