

Multiplication of Radical Expressions

Rule

$$\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{a \cdot b}$$

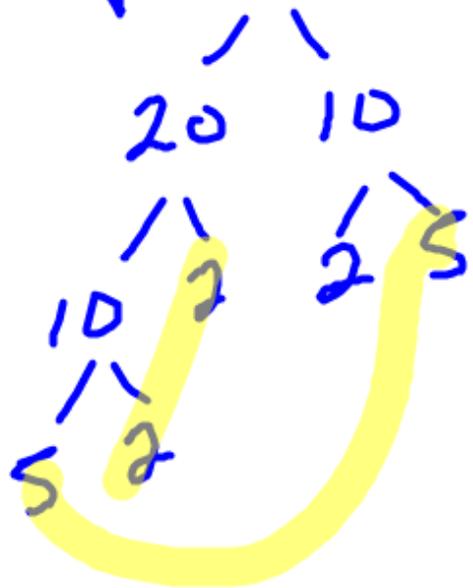
$$a) \sqrt{3} \cdot \sqrt{5} = \sqrt{3 \cdot 5} = \sqrt{15}$$

$$c) \sqrt[3]{4} \cdot \sqrt[3]{5} = \sqrt[3]{4 \cdot 5} = \sqrt[3]{20}$$

$$b) \sqrt{x+3} \sqrt{x-3} = \sqrt{(x+3)(x-3)}$$
$$\sqrt{x^2 - 9}$$

$$d) \sqrt[4]{\frac{y}{5}} \sqrt[4]{\frac{7}{x}} = \sqrt[4]{\frac{7y}{5x}}$$

$$\begin{aligned} \text{ex2 a) } \sqrt{200} &= \sqrt{100} \cdot \sqrt{2} \\ &= 10\sqrt{2} \end{aligned}$$

$$\sqrt{200} = 2.5\sqrt{2} = 10\sqrt{2}$$


$$\sqrt{3920}$$

$$\begin{array}{r} \diagup \quad \diagdown \\ 392 \quad 10 \end{array}$$

$$\begin{array}{r} \diagup \quad \diagdown \quad \diagup \quad \diagdown \\ 196 \quad 2 \quad 5 \quad 2 \end{array}$$

$$\begin{array}{r} \diagup \quad \diagdown \\ 2 \quad 98 \end{array}$$

$$\begin{array}{r} \diagup \quad \diagdown \\ 2 \quad 49 \end{array}$$

$$\begin{array}{r} \diagup \quad \diagdown \\ 7 \quad 7 \end{array}$$

$$= 2 \cdot 2 \cdot 7 \sqrt{5}$$

$$= 28 \sqrt{5}$$

$$= \sqrt{4} \cdot \sqrt{4} \cdot \sqrt{49} \cdot \sqrt{5}$$

$$\sqrt{18x^2y} = \sqrt{18} \sqrt{x^2} \sqrt{y}$$

$\begin{array}{c} \swarrow \quad \searrow \\ 9 \quad 2 \\ \swarrow \quad \searrow \\ 3 \quad 3 \end{array}$ $\begin{array}{c} \swarrow \quad \searrow \\ x \quad x \end{array}$

$$= 3x\sqrt{2y}$$

$$\sqrt[4]{162x^6}$$

$$= \sqrt[4]{162} \sqrt[4]{x^6}$$

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

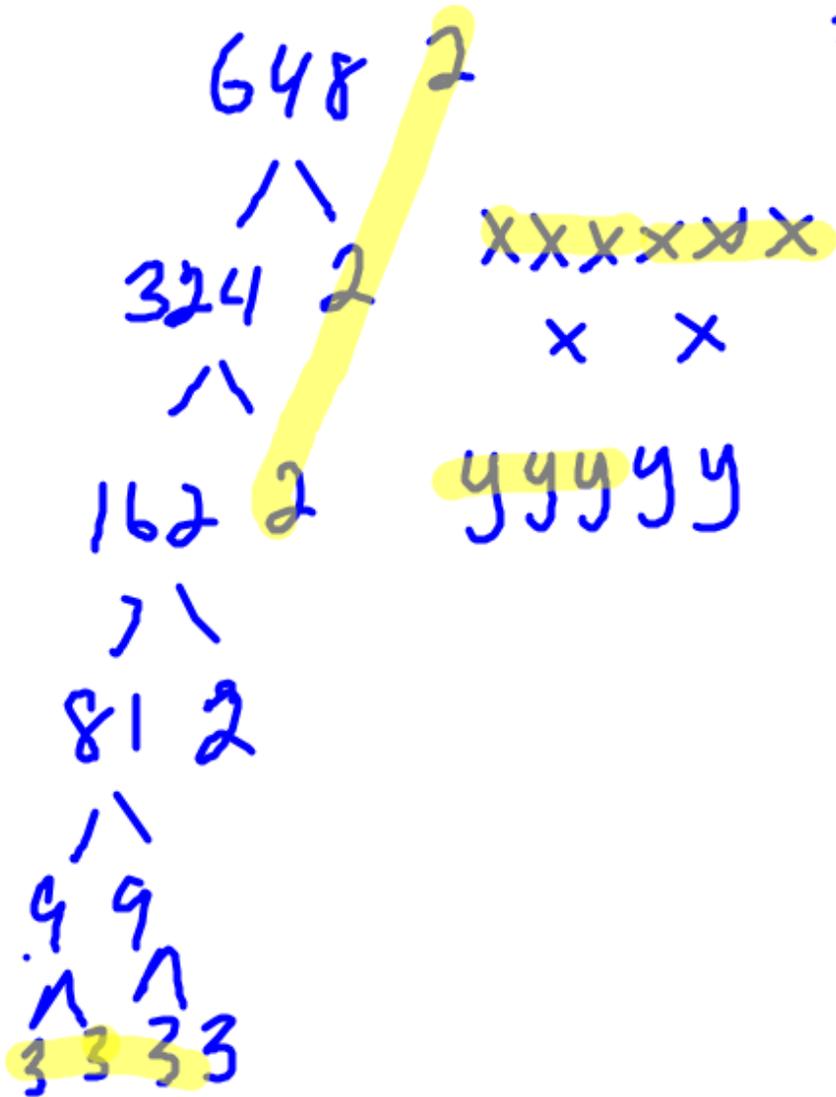


$$\sqrt[4]{x^6}$$

~~xxxxxx~~

$$\sqrt[3]{1296x^6y^5} = 2 \cdot 3x^2y \sqrt[3]{2 \cdot 3y^2}$$

$$= 6x^2y \sqrt[3]{6y^2}$$



$$\text{ex 5) } 3 \sqrt[3]{25} \cdot 2 \sqrt[3]{5} \quad 3 \cdot 2 \cdot 5 = 30$$


$$\sqrt[4]{8x^3y^5} \cdot \sqrt[4]{4x^2y^3} = 2xy^2 \sqrt[4]{2x}$$

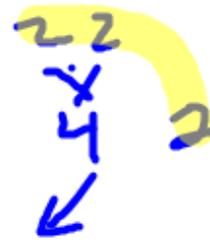
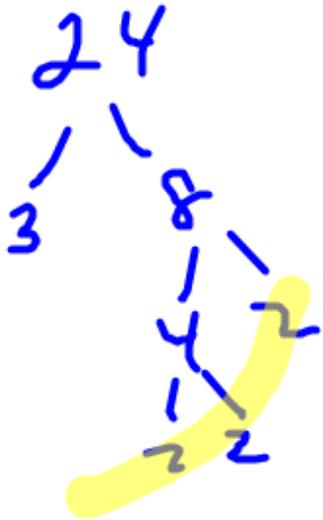

Division of Radical Expressions

$$\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$$

$$\sqrt{\frac{49}{81}} = \frac{\sqrt{49}}{\sqrt{81}} = \frac{7}{9}$$

$$\sqrt[3]{\frac{24}{81}} = \frac{\sqrt[3]{8}}{\sqrt[3]{27}} = \frac{2}{3}$$

$$\frac{2\sqrt[3]{3}}{3\sqrt[3]{3}}$$



$$\sqrt{\frac{16x^3}{y^8}} = \frac{\sqrt{16} \sqrt{x^3}}{\sqrt{y^8}} = \frac{4x\sqrt{x}}{y^4}$$

$$\frac{\sqrt[4]{18a^9b^5}}{\sqrt[4]{3b}}$$

→

$$\sqrt[4]{\frac{18a^9b^5}{3b}}$$

$$= \sqrt[4]{6a^9b^4}$$

bbbb
aaaa
aaaa
a

$$= a^2b \sqrt[4]{6a}$$

$$\frac{\sqrt[4]{18a^9b^5}}{\sqrt[4]{3b}} = \frac{a^2b\sqrt[4]{18ab}}{\sqrt[4]{3b}}$$
$$= a^2b\sqrt[4]{6a}$$

$$\sqrt{\frac{7}{3}} = \frac{\sqrt{7} \sqrt{3}}{\sqrt{3} \sqrt{3}} = \frac{\sqrt{21}}{\sqrt{9}} = \frac{\sqrt{21}}{3}$$

$$\frac{3\sqrt{2} \cdot \sqrt{7}}{5\sqrt{7} \cdot \sqrt{7}} = \frac{3\sqrt{14}}{5\sqrt{49}} = \frac{3\sqrt{14}}{35}$$

↓
7

$$\frac{\sqrt{7x} \sqrt{5y}}{\sqrt{5y} \sqrt{5y}} = \frac{\sqrt{35xy}}{5y}$$

$$\frac{\sqrt[3]{2xy} \sqrt[3]{5} \sqrt[3]{5}}{\sqrt[3]{5} \sqrt[3]{5} \sqrt[3]{5}} = \frac{\sqrt[3]{50xy}}{5}$$

$\sqrt[3]{5^3}$ 