

Chapter 5: Radicals

Convert between mixed radicals + entire radicals.

Mixed \rightarrow Entire

$$1) \quad 2\sqrt{7}$$

$$\sqrt{(2 \cdot 2)7}$$

$$\sqrt{28}$$

$$2. \quad 4\sqrt[3]{2}$$

$$\sqrt[3]{(4 \cdot 4 \cdot 4)2}$$

$$\sqrt[3]{128}$$

$$3. \quad 3\sqrt[4]{5}$$

$$\sqrt[4]{(3 \cdot 3 \cdot 3 \cdot 3)5}$$

$$\sqrt[4]{405}$$

$$4. \quad a^4\sqrt{a}$$

$$\sqrt{(a^4 \cdot a^4)a}$$

$$\sqrt{a^9}$$

$$5. \quad 5b\sqrt[3]{3b^2}$$

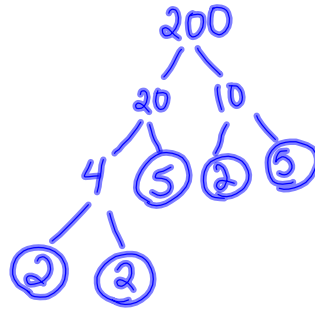
$$\sqrt[3]{(5b)(5b)(5b)3b^2}$$

$$\sqrt[3]{375b^5}$$

Convert to mixed Radical

1. $\sqrt{200}$

$\sqrt{(2 \cdot 2) \cdot 2 \cdot (5 \cdot 5)}$



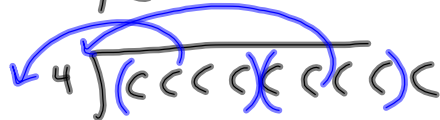
$2 \cdot 5 \sqrt{2}$
 $10\sqrt{2}$

$\Sigma 4, 9, 16, 25, 36, 49, 64, 81, 100$

or $\sqrt{200}$

$\sqrt{100} \cdot \sqrt{2}$
 $10\sqrt{2}$

2. $\sqrt[4]{c^9}$

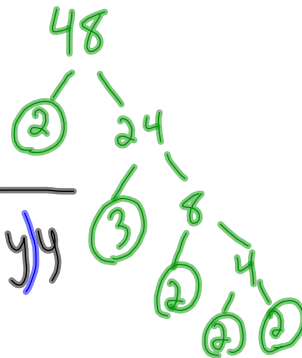


$c \cdot c \sqrt[4]{c}$

$c^2 \sqrt[4]{c}$

3. $\sqrt{48y^5}$

$\sqrt{(2 \cdot 2)(2 \cdot 2) \cdot 3(y \cdot y \cdot y \cdot y)}$



$2 \cdot 2 \cdot y \cdot y \sqrt{3y}$

$4y^2 \sqrt{3y}$

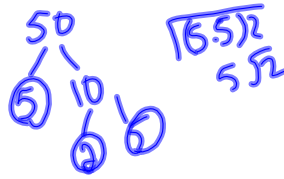
$\sqrt{48y^5}$
 $\sqrt{16y^4} \cdot \sqrt{3y}$
 $4y^2 \sqrt{3y}$

Adding / Subtracting Radicals

1. $\sqrt{50} + 3\sqrt{2}$

* like terms
(like radicals)

$$\begin{aligned} 5\sqrt{2} + 3\sqrt{2} \\ 8\sqrt{2} \end{aligned}$$



2. $-\sqrt{27} + 3\sqrt{5} - \sqrt{80} - 2\sqrt{12}$

$$\begin{aligned} -\sqrt{9 \cdot 3} + 3\sqrt{5} - \sqrt{16 \cdot 5} - 2(\sqrt{4 \cdot 3}) \\ -3\sqrt{3} + 3\sqrt{5} - 4\sqrt{5} - 2 \cdot 2\sqrt{3} \\ -3\sqrt{3} + 3\sqrt{5} - 4\sqrt{5} - 4\sqrt{3} \\ \boxed{-7\sqrt{3} - \sqrt{5}} \end{aligned}$$

Practice p 9. 278

3, 9, 10

9d) $\frac{2}{3} \sqrt[3]{81} + \frac{5}{4} \sqrt[3]{375} - 4\sqrt{99} + 5\sqrt{11}$

$$\begin{array}{ccc} \sqrt[3]{81} & \sqrt[3]{375} & \sqrt{99} \\ \sqrt[3]{(3 \cdot 3 \cdot 3) \cdot 3} & \sqrt[3]{(5 \cdot 5 \cdot 5) \cdot 3} & \sqrt{(3 \cdot 3) \cdot 11} \\ 3\sqrt[3]{3} & 5\sqrt[3]{3} & 3\sqrt{11} \end{array}$$

$$\frac{2}{3} (3\sqrt[3]{3}) + \frac{5}{4} \sqrt[3]{3} - 4(3\sqrt{11}) + 5\sqrt{11}$$

$$\frac{2}{1} \sqrt[3]{3} + \frac{5}{4} \sqrt[3]{3} - 12\sqrt{11} + 5\sqrt{11}$$

$\frac{2}{4} + \frac{5}{4}$

$$\boxed{\frac{13}{4} \sqrt[3]{3} - 7\sqrt{11}}$$