

DRILL

$$\textcircled{1} \quad x^{\ominus} | x^4 = \boxed{x^3}$$

$$\textcircled{2} \quad \frac{2 \cdot \cancel{12}}{2 \cdot \cancel{4}} + \frac{\cancel{5}^3}{\cancel{4}_4} = \boxed{\frac{5}{4}}$$

$$\textcircled{3} \quad \frac{5 \cdot \cancel{2}}{\cancel{5}_5} - \frac{\cancel{3}^3}{\cancel{5}_5} = \boxed{\frac{7}{5}}$$

$$\textcircled{4} \quad \sqrt[3]{8x^5} = \boxed{2x \sqrt[3]{x^2}}$$

$$\frac{\cancel{1}^1}{\cancel{5}_5} - \frac{\cancel{3}^3}{\cancel{5}_5} = \frac{7}{5}$$

$$\sqrt[3]{8} = 2$$

Rational Exponents / Fractional Exponents

$a^{\frac{x}{n}}$ ← exponent
← index = $\sqrt[n]{a^x}$

Fraction Exponent

Ex: $x^{\frac{2}{3}}$ = $\sqrt[3]{x^2}$
 $b^{\frac{5}{7}}$ = $\sqrt[7]{b^5}$

Radical

$\sqrt[4]{x^9} = x^{\frac{9}{4}}$
 $\sqrt[12]{x^5} = x^{\frac{5}{12}}$

Ex:

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

$$a^{\frac{1}{2}} = \sqrt{a}$$

$$\underline{b^{\frac{3}{5}}} = \sqrt[5]{b^3}$$

Ex:

$$\frac{b^{1/2}}{b^{3/4}}$$

$$b^{1/2 - 3/4}$$

1/2 ← op
3/4 ← index

$$\sqrt[4]{b^{1/2}}$$

$$b^{-1/4}$$

or

$$\sqrt[4]{b^{-1}}$$

$$\frac{2}{5} - \frac{1}{3}$$

$$\frac{6}{15} - \frac{5}{15} = \frac{1}{15}$$

$$\begin{array}{r} 5 \cdot 15 \\ 12 \overline{) 180} \\ \underline{12} \\ 60 \\ \underline{60} \\ 0 \end{array} \quad - \quad \begin{array}{r} 3 \cdot 3 \\ 12 \overline{) 36} \\ \underline{12} \\ 24 \\ \underline{24} \\ 0 \end{array} = \begin{array}{r} 15 \cdot 15 \\ 12 \overline{) 225} \\ \underline{12} \\ 105 \\ \underline{105} \\ 0 \end{array}$$

$$\frac{X^{\frac{15}{12}}}{X^{\frac{3}{12}}} = X^{\frac{15-3}{12}} = X^{\frac{12}{12}} = X^1 = X$$

$$\frac{x^{-5/9}}{x^{-1/9}} = x^{-5/9 - (-1/9)} = x^{-4/9} = x^{4/9} = \sqrt[9]{x^4}$$

$$\frac{x^{2/15}}{x^{1/2}} = x^{2/15 - 1/2} = x^{4/30 - 15/30} = x^{-11/30} = \frac{1}{x^{11/30}}$$

$$\frac{x^{25/60} - x^{2/60}}{x^{1/60}} = x^{25/60 - 1/60} - x^{2/60 - 1/60} = x^{24/60} - x^{1/60} = x^{2/5} - x^{1/60}$$