

## Simplifying exponential Expressions

1.)  $m^3 \cdot m \cdot m^4$

$$\boxed{m^8}$$

2.)  $-1(x^3y)^2$  <sup>set of</sup>

$$-1 \cdot x^6y^2$$

$$-1x^6y^2 \text{ or } \boxed{-x^6y^2}$$

3.)  $(5x)^2 \cdot (-2x)^3$

$$5^2 \cdot x^2 \cdot (-2)^3 \cdot x^3$$

$$25 \cdot \underset{x \cdot x}{x^2} \cdot (-8) \cdot \underset{x \cdot x \cdot x}{x^3}$$

$$\boxed{-200x^5}$$

4.)  $(2x^2y)^3(-3xy)^2$  <sup>set</sup>

$$2^3 \cdot \underline{x^6} \cdot \underline{y^3} \cdot (-3)^2 \cdot \underline{x^2} \cdot \underline{y^2}$$

$$\boxed{72x^8y^5}$$

5.)  $\left(\frac{3}{4}\right)^{-2}$  <sup>reciprocal</sup>

$$\left(\frac{4}{3}\right)^2 = \frac{4^2}{3^2}$$

$$\boxed{\frac{16}{9}} \text{ or } 1\frac{7}{9}$$

6.)  $m^3 n^5$  <sup>rec</sup>

$$\boxed{\frac{n^5}{m^3}} \quad m \neq 0$$

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4.)  $(2x^2y)^3 (-3xy^2)^2$  <sup>2) set</sup>

$$2^3 \cdot \underline{x^6} \cdot \underline{y^3} \cdot (-3)^2 \cdot \underline{x^2} \cdot \underline{y^4}$$

$$\boxed{72x^8y^7}$$

5.)  $\left(\frac{3}{4}\right)^2 \rightarrow \text{reciprocal}$

$$\left(\frac{4}{3}\right)^2 = \frac{4^2}{3^2}$$

$$\boxed{\frac{16}{9}} \text{ or } 1\frac{7}{9}$$

6.)  $m^3 n^5$  <sup>Rec.</sup>

$$\boxed{\frac{n^5}{m^3}}$$

$$m \neq 0$$

$$7.) (15r)^0$$

$$\boxed{1} \quad r \neq 0$$

$$8.) \frac{1}{7(k^{-3})}$$

$$\boxed{\frac{k^3}{7}} \quad k \neq 0$$

$$9.) \frac{2}{(8x)^{-3}}$$

$$2 \cdot (8x)^3$$

$$2 \cdot 8^3 \cdot x^3$$

$$\boxed{1024x^3} \quad x \neq 0$$

$$10.) \frac{x^{-4}}{(12y^2)^{-2}}$$

$$\frac{12^2 y^4}{x^4}$$

$$\boxed{\frac{144y^4}{x^4}} \quad x \neq 0$$

$$y \neq 0$$

$$11.) \frac{b^{15}}{b^9}$$

$$\boxed{b^6} \quad b \neq 0$$

$$12.) \frac{x^8}{x^{12}}$$

$$\boxed{\frac{1}{x^4}} \quad x \neq 0$$

$$13.) \left( \frac{c^7}{d^{10}} \right)^4$$

$$\boxed{\frac{c^{28}}{d^{40}}} \quad d \neq 0$$

$$14.) \left( \frac{b^{10} b^7}{b^8} \right)^{-2}$$

$$\boxed{\frac{1}{b^{14}}} \quad b \neq 0$$

$$15.) \frac{(a^6 \cdot a^3)^3}{a^7}$$

$$\frac{(a^9)^3}{a^7}$$

$$\boxed{a^{20}} \quad a \neq 0$$

~~$\frac{a^{27}}{a^7} = a^{20}$~~

$$16.) \left( \frac{3x^2 y^3}{x^8 y^{-5}} \right)^3$$

$$\left( \frac{3y^3}{x^{10}} \right)^3$$

$$\boxed{\frac{27y^{18}}{x^{30}}} \quad x, y \neq 0$$

$$17.) \frac{-10xy^8}{2x^4yz^2} \cdot \frac{-5xy^{-2}}{(1y)^{-2}} \rightarrow \frac{-5y^6y}{x^3x^2} \cdot \frac{5x}{y^2}$$

$$\boxed{\frac{-25y}{x^2}} \quad x, y \neq 0$$

$$18.) \frac{m^2}{m^4} \cdot \frac{1}{m^2}$$

$$\boxed{m^2} \quad m \neq 0$$

$$19.) \left[ (8+b)^2 \right]^3$$

$$\boxed{(8+b)^6}$$

$$20.) \left( \frac{5xy}{2x^2y^2} \right)^2 \cdot \frac{2y^3}{5x^2y^2}$$

$$\left( \frac{5x^2}{2y} \right)^2 \cdot \frac{2}{5x^2y^2}$$

$$\frac{\cancel{25}^5 \cancel{x^4}^2}{\cancel{4}^2 y^2} \cdot \frac{\cancel{2}^1}{\cancel{5}^1 \cancel{x^2}^2 y^2}$$

$$\boxed{\frac{5x^2}{2y^4}}$$

$$x, y \neq 0$$