

Period 1

Name

Date

5.4

Division properties of Exponents.

$$1) \frac{5^6}{5^2} = \frac{\cancel{5} \cdot \cancel{5} \cdot 5 \cdot 5 \cdot 5 \cdot 5}{\cancel{5} \cdot \cancel{5}} = 5^4 = 625$$

$$\frac{5^6}{5^2} = 5^{6-2} = 5^4 = 625$$

$$2) \frac{5^5}{5^2} = 5^{5-2} = 5^3 = 125$$

$$3) \frac{x^{\frac{5}{8}}}{x^{\frac{3}{8}}} = x^{\frac{5}{8} - \frac{3}{8}} = x^{\frac{2}{8}} = x^{\frac{1}{4}}$$

$$4) \frac{m^{-3}}{m^{-5}} = m^{-3+5} = m^2$$

$$5) \frac{x^6 y^9}{x^2 y^5} = x^{6-2} y^{9-5} = x^4 y^4$$

$$6) \frac{21 m^{\frac{3}{4}}}{3 m^{\frac{1}{4}}} = 7 m^{\frac{3}{4} - \frac{1}{4}} \quad (7 m^{\frac{1}{2}})$$

$$7) \left(\frac{3^4}{5^4}\right)^4 = \frac{3^4}{5^4} = \frac{\overset{4}{\underset{15}{3 \cdot 3 \cdot 3 \cdot 3}}}{\overset{4}{\underset{25}{5 \cdot 5 \cdot 5 \cdot 5}}} = \frac{81}{625}$$

$$8) \left(\frac{3^3 x^3}{2^2 y^2}\right)^3 = \frac{3^3 x^3}{2^2 y^2} = \frac{27 x^3}{8 y^3}$$

$$9) \left(\frac{4^2}{7^2}\right)^{-2} = \frac{4^{-2}}{7^{-2}} = \frac{7^2}{4^2} = \frac{49}{16}$$

$$10) \left(\frac{-3^3 x^4}{2^3 y^5}\right)^{-3} = \frac{-3^{-3} x^{-12}}{2^{-3} y^{-15}} = \frac{-2^3 x^{15}}{3^3 x^2} = \frac{-8 y^{15}}{27 x^2}$$

$$11) \left(\frac{12^4 p^{\frac{3}{2}}}{15^4 p^4}\right)^4 = \frac{12^4 p^{\frac{12}{2}}}{15^4 p^4} = \frac{12^4 p^6}{15^4 p^4} = \frac{256 p^{6-4}}{625} = \frac{256 p^2}{625}$$

$$12) \left(\frac{a^1 b^3}{a^5 b^1}\right)^{-2} = \frac{a^{-2} b^{-6}}{a^{-10} b^{-2}} = \frac{a^{10} b^2}{a^2 b^6} = a^{10-2} b^{2-6} = a^8 b^{-4} = \frac{a^8}{b^4}$$

Explain why each expression is not in simplest form.

15) $2^4 t^3$ not simplified the 2^4 needs to be simplified.

$$\textcircled{16t^3}$$

16) $(3x)^2$ Both factors should be squared.

$$\textcircled{9x^2}$$

17) $m^3 n^0$ The n^0 is a 1
 $m^3 \cdot 1 = \textcircled{m^3}$

18) $\frac{y^5}{y}$ you need to subtract $5 - 1$.
it needs to be simplified to $\textcircled{y^4}$

$$19) \frac{3.6 \times 10^7}{1.5 \times 10^3}$$

$$2.4 \times 10^{7-3}$$

$$\textcircled{2.4 \times 10^4}$$

$$20) \frac{4.5 \times 10^{-6}}{5 \times 10^{-2}}$$

$$0.9 \times 10^{-6-(-2)}$$

$$0.9 \times 10^{-4-1}$$

left subtract

$$\textcircled{9. \times 10^{-5}}$$

$$13) \left(\frac{3^1 x^2 y^5 z^{-2}}{5 x^1 z^5} \right)^{-3}$$

$$\frac{3^{-3} x^{-6} y^{-15} z^6}{5^{-3} x^{-3} y^{-15}}$$

$$\frac{5^3 x^3 y^{15} z^6}{3^2 x^6 y^{15}}$$

$$\frac{125 x^{3-6} y^{15-15} z^6}{9}$$

$$\frac{125 z^6}{9 x^3}$$

$$14) \frac{(4m^2)(3n^5)}{(2m^{-3})(-m^3n^3)}$$
~~$$\frac{12m^2n^5}{-2m^0n^3}$$~~

$$\frac{12 m^2 n^5}{2 m^{\textcircled{3}} (-m^{\textcircled{3}} n^3)}$$

$$\frac{12 m^2 n^5}{-2 n^3}$$

$$\textcircled{-6 m^2 n^2}$$