

Ex: Evaluate each expression.

a. $\frac{10^5}{10^{7-5}} = 10^{-2} = \frac{1}{10^2} = \frac{1}{100}$

b. $3^{-5} \cdot 3^8 = 3^3 = 27$

c. $\frac{2^3}{2^3} = 2^{3-3} = 2^0 = 1$

Simplify and write each expression with positive exponents only.

a. $\frac{r^4}{r^6} = r^{4-6} = r^{-2} = \frac{1}{r^2}$

b. $\frac{m^5 n^1}{m^2 n^9} = m^{5-2} n^{1-9} = m^3 n^{-8}$

c. $c^{-4} \cdot c^4 = c^{-4+4} = c^0 = 1$
 $= \frac{m^3}{n^8}$

d. $\frac{d^4 f^3}{d^4 f^3} = d^{4-4} f^{3-3} = d^{-2} f^0$
 $= \frac{1}{d^2}$

e. $\frac{b^6 \cdot b^{-2}}{b^4}$

- $\frac{b^6}{b^4 b^2} = \frac{b^6}{b^{4+2}} = \frac{b^6}{b^6} = 1$
- $\frac{b^{6+(-2)}}{b^4} = \frac{b^4}{b^4} = 1$
- $b^{6-4} \cdot b^{-2} = b^2 \cdot b^{-2}$
 $= b^{2+(-2)} = b^0 = 1$

$$f. \frac{x^2 y^3}{x^3 y^2} = x^{2-3} y^{3-2} = \boxed{x^{-1}} y^1$$

$$g. \boxed{5d^{-3}} = \frac{5}{d^3} = \frac{y}{x}$$

$$h. \frac{\boxed{p^{-1}}}{\boxed{q^{-5}}} = \frac{q^5}{p^1} = \frac{q^5}{p}$$

$$i. \frac{-20 \boxed{a^{-2}} b^4}{5 \boxed{a^{-3}} \boxed{b^{-1}}} = \frac{-4 a^3 b^1 b^4}{a^2}$$

$$-4 a^{3-2} b^{1+4} = -4 a b^5$$

$$-4 a^{-2-(-3)} b^{4-(-1)}$$

$$-4 a^1 b^5$$