

## Power Laws Worksheet

1. Simplify each expression using the power laws. All final answers should have positive exponents.

a.  $(x^2)(x^9)(x^{-7})$

b.  $\frac{x^5}{x^8}$

c.  $x^{-1} \cdot x^{-3}$

d.  $(x^{-3})(x^4)$

e.  $(x^{-6})^{-3}$

f.  $(x^{-5})^5$

g.  $(x^3)(x^0)$

h.  $\frac{(x^{12})(x^{-6})}{x^7}$

i.  $x^8 \cdot x \div x^{-7}$

2. Simplify each expression using the power laws and then evaluate. All final answers should have positive exponents.

a.  $(2^{-3})(2^{-4})$

b.  $(3^{-4})(3^5)$

c.  $5^0 \times 5^{-2}$

d.  $4^{-5} \div 4^{-3}$

e.  $\left(\frac{2}{3}\right)^{-1} \left(\frac{2}{3}\right)^3$

f.  $\left(\frac{3}{4}\right)^{-2} \div \left(\frac{3}{4}\right)^2$

3. Write each of the following with positive exponents.

a.  $5^{-3}$

b.  $\frac{1}{4^{-3}}$

c.  $\frac{x^3}{y^{-2}}$

d.  $\left(\frac{3}{5}\right)^{-4}$

e.  $\frac{2x^{-2}y^3}{3w^{-4}}$

f.  $\frac{1}{a^3b^{-2}}$

4. Evaluate each of the following.

a.  $2^{-3}$

b.  $(-5)^{-2}$

c.  $\left(\frac{5}{3}\right)^{-3}$

d.  $(-7)^0$

e.  $\frac{2}{3^{-2}}$

f.  $\frac{5^{-1}}{2^3}$

g.  $\left(\frac{3^3}{5}\right)^{-2}$

h.  $\left(\frac{2^{-2}}{3^{-1}}\right)^{-2}$

i.  $\left(-12\frac{3}{4}\right)^0$

5. Simplify each of the following expressions. Write the answer with positive exponents.

a.  $m^6 \cdot m^{-3}$

b.  $a^{-3} \div a^{-5}$

c.  $(x^2 y^{-1})^{-1}$

d.  $\left(\frac{b^{-2}}{b^{-1}}\right)^{-3}$

e.  $(x^{-1} y^0)^{-3}$

f.  $(15r^{-4})(2r^{-3})$

6. Evaluate each of the following.

a.  $\frac{2^{-1} + 2^{-3}}{2^{-2}}$

b.  $\frac{3^{-2} + 3^{-3}}{3^{-2} - 3^{-3}}$

c.  $\frac{3^{-6} \times 3^{-5}}{3^{-9}}$

d.  $\frac{(10^2)(10^3)(10)}{10^5 \div 10^2}$

e.  $\frac{10^2 \div 10^{-2}}{10^6}$

f.  $\frac{10^{-6} \times 10^{-5}}{10^{-3}}$