

Math 10C  
Exponent Skills

Name Key  
Date \_\_\_\_\_

1. Expand (show some work) and evaluate.

a)  $(-2)^4$

$$-2 \times -2 \times -2 \times -2$$
$$\boxed{16}$$

b)  $-6^2$

$$-6 \times 6$$
$$\boxed{-36}$$

c)  $\left(\frac{1}{3}\right)^4$

$$\frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3}$$
$$\boxed{\frac{1}{81}}$$

d)  $\left(\frac{2}{5}\right)^{-2}$

$$\left(\frac{5}{2}\right)^2$$
$$\boxed{\frac{25}{4}}$$

e)  $9^{\frac{1}{2}}$

$$\left(\sqrt[2]{9}\right)^1$$
$$\frac{(3)^1}{3}$$
$$\boxed{3}$$

f)  $9^{\frac{1}{2}}$

$$\frac{1}{9^{\frac{1}{2}}}$$
$$\frac{1}{\left(\sqrt[2]{9}\right)^1}$$
$$\boxed{\frac{1}{3}}$$

g)  $\left(\frac{8}{27}\right)^{\frac{1}{3}}$

$$\frac{\left(\sqrt[3]{8}\right)^1}{\left(\sqrt[3]{27}\right)^1}$$
$$\boxed{\frac{2}{3}}$$

h)  $\left(-\frac{8}{27}\right)^{\frac{1}{3}}$

$$\left(\frac{-27}{8}\right)^{\frac{1}{3}}$$
$$\frac{\left(\sqrt[3]{-27}\right)^1}{\left(\sqrt[3]{8}\right)^1}$$
$$\boxed{-\frac{3}{2}}$$

2. Simplify. Answer with positive exponents.

a)  $(4a^5b^2)(3a^3b^1)$

$$12a^8b^3$$

c)  $(2x^3y)^4$

$$16x^{12}y^4$$

e)  $\frac{25a^4b^8c^2}{5a^6b^{-2}c^2}$

$$\frac{5a^{-2}b^{10}}{1} \cdot \frac{5b^{10}}{a^2}$$

g)  $(x^{-2}y^{-1})^3$

$$\frac{x^{-6}y^{-3}}{1} \cdot \frac{1}{x^6y^3}$$

i)  $\frac{(3x^2y)^2}{(2xy^2)^3}$

$$\frac{9x^4y^2}{8x^3y^6}$$

$$\frac{9xy^{-4}}{8} = \frac{9x^1}{8y^4}$$

b)  $\frac{12x^8y^6}{6x^2y^4}$

$$2x^6y^2$$

d)  $(3c^2d^{-3})(-5c^3d^1)$

$$-15c^5d^{-2}$$

$$\frac{-15c^5}{d^2}$$

f)  $(-2a^{-2}b^3)^3$

$$\frac{-8a^{-6}b^9}{1}$$

$$\frac{-8b^9}{a^6}$$

h)  $\frac{m^{-3}n^4}{m^3n^2}$

$$\frac{m^{-6}n^2}{1} \cdot \frac{1}{n^2}$$

$$\frac{1}{m^6}$$

j)  $\left(\frac{4x^2}{3y^3}\right)^2 \cdot \left(\frac{3}{2x^3y^2}\right)^3$

$$\left(\frac{16x^4}{9y^6}\right) \cdot \left(\frac{27}{8x^9y^6}\right)$$

$$\frac{6x^4}{x^9y^{12}} = \frac{6x^{-5}}{y^{12}} = \frac{6}{x^5y^{12}}$$