

### Exponent Rules

Let  $a$  and  $b$  be a nonzero real number and  $m$  and  $n$  be any integer

$$a^{-n} = \frac{1}{a^n}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$a^m \cdot a^n = a^{m+n}$$

$$(a^m)^n = a^{mn}$$

$$(ab)^m = a^m b^m$$

$$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$$

1. Write each expression without negative exponents, and evaluate if possible. Assume all variables represent nonzero real numbers.

a.  $\left(\frac{9}{16}\right)^{\frac{3}{2}}$

c.  $-\left(\frac{27}{8}\right)^{\frac{2}{3}}$

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

b.  $\left(\frac{9}{16}\right)^{-\frac{3}{2}}$

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

f.  $(5t)^{-3}$

2. Simplify each expression. Write answers without negative exponents. Assume all variables represent real numbers.

a.  $\frac{5^9}{5^7}$

c.  $\frac{15a^{-5}b^{-1}}{25a^{-2}b^4}$

b.  $\frac{15s^{-4}}{5s^{-8}}$

d.  $\frac{(-8xy)y^3}{4x^3y^4}$

e.  $\frac{12k^{-2}(k^{-3})^{-4}}{6k^5}$

3. Evaluate each expression

a.  $121^{\frac{1}{2}}$

b.  $(-\frac{8}{27})^{\frac{1}{3}}$

4. Simplify each expression. Write answers without negative exponents. Assume all variables represent positive real numbers.

a.  $27^{\frac{4}{3}}$

c.  $6^{\frac{4}{3}} \cdot 6^{\frac{2}{3}}$

b.  $(-32)^{\frac{4}{5}}$

d.  $\frac{(r^{1/5}s^{2/3})^{15}}{r^2}$

Homework:

Pg. 63  
15, 19, 35, 41, 43, 49, 55, 65

Most Difficult First:

Pg. 63  
46, 78