

## 2.6 Using Powers

$$a^5 \cdot a^2 = a^7$$

$$a^{10} \div a^3 = \frac{a^{10}}{a^3} = a^7$$

$$3^3 = 27$$

$$3^2 = 9$$

$$3^1 = 3$$

$$3^0 = 1 \leftarrow \text{zero exponent}$$

$$3^{-1} = \frac{1}{3} \leftarrow \text{Negative exponent}$$

$$3^{-2} = \frac{1}{9}$$

$$a^0 = 1 \quad -(a)^0 = -1$$

Any number to the zero power is 1

$a^{-m}$  place the inverse

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

$$\left(\frac{1}{a}\right)^{-m} = a^m$$

## Simplify Expressions

$$\frac{a^2 b^{-3} c}{a b^3 c^{-2}}$$

$b^2$  to bottom  
 $c^2$  to top

$$\frac{a^2 c^3}{a b^5}$$

simplify a

$$\frac{a c^3}{b^5}$$

$$\frac{a^2}{a} = a^{2-1}$$

$$= a$$

$$\frac{c}{c^{-2}} = c^{1-(-2)} = c^3$$

$$2a^5 b^{-1} c^2 d^{-5} \quad \text{move } b, d$$

$$\frac{2a^5 c^2}{b d^5}$$

$$\frac{(2a)^{-2} b^3}{c^{-2}}$$

$$\frac{b^3 c^2}{(2a)^2}$$

$$\frac{b^3 c^2}{4a^2}$$

Square root      cube root

$$b = \sqrt{a}$$

$$\hookrightarrow b^2 = a$$

$$\sqrt{a} = a^{\frac{1}{2}}$$

$$\sqrt[3]{a} = a^{\frac{1}{3}}$$

$$\sqrt[3]{a^2 b}$$

$$\sqrt[3]{a^2} \cdot \sqrt[3]{b}$$

$$a^{\frac{2}{3}} b^{\frac{1}{3}} = (a^2 b)^{\frac{1}{3}}$$

Fraction  $\rightarrow$  root

$$12 a^{\frac{1}{4}} b^{\frac{3}{4}}$$

$$12 \sqrt[4]{a b^3}$$

$$\frac{7}{(4h)^{\frac{1}{3}}}$$

$$\frac{7}{\sqrt[3]{4h}}$$

$$\sqrt[3]{8} = \sqrt[3]{2^3} = 2$$

$$\sqrt{64} = \sqrt{8^2} = 8$$