

### Definition of Exponents

$$x^n = x \cdot x \cdot x \cdot \dots \cdot x$$

$x = \text{base}$     $n = \text{exponent}$   
(note there are  $n$   $x$ 's in the product)

### Multiplying Like Bases With Exponents

(The Product Rule for Exponents)

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

### Zero as an Exponent

$$x^0 = 1$$

### Dividing Like Bases With Exponents

(Quotient Rule for Exponents)

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

### Base Raised to Two Exponents

(Power of a Power Rule for Exponents)

$$(x^m)^n = x^{m \cdot n}$$

### A Product Raised to an Exponent

(Power of a Product Rule)

$$(xy)^n = x^n \cdot y^n$$

### A Quotient Raised to an Exponent

(Power of a Quotient Rule)

$$\left(\frac{x}{y}\right)^n = \frac{x^n}{y^n}$$

### Negative Exponents

$$x^{-n} = \frac{1}{x^n} \qquad \frac{1}{x^{-n}} = x^n$$