

# R1.3

## Exponents

4 · 4 · 4

4<sup>3</sup> exponent

base

$$2^3 \cdot 2^4$$

Add  
exponents

$$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$$

$$2^7$$

Product of powers

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

$$x(x^2 + 1)$$

$$x^3 + x$$

$$x^4 \cdot x^5$$

$$x^9$$

$$\frac{3^5}{3^2}$$

$$\frac{\cancel{3} \cdot \cancel{3} \cdot 3 \cdot 3 \cdot 3}{\cancel{3} \cdot \cancel{3}}$$

$3^{5-2}$   
Quotient  
of Powers

$3^3$   
Subtract  
Exponent

$$\frac{x^7}{x^5}$$

$$x^2$$

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

$$(2x)^3 = 8x^3$$

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$$(x+4)^2$$

$$(x+4)(x+4)$$

$$x^2 + 8x + 16$$

$$\left(\frac{x}{4}\right)^2$$

$$\frac{x^2}{16}$$

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



$$(2^4)^3$$

$$2^{12}$$

Multiply  
Exponents

Power of a Power

$$(2^4)(2^4)(2^4)$$

$$2^{12}$$

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

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

$$2^{-3} = \frac{1}{2^3}$$
$$= \frac{1}{8}$$

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

$$2 \cdot x^{-1} = \frac{1}{2} = .5$$



$$a^0 = 1$$

$$a \neq 0$$

$0^0$  undefined

$$10^3 = 1,000$$

$$10^2 = 100$$

$$10^1 = 10$$

$$10^0 = 1$$

$$10^{-1} = \frac{1}{10} = .1$$

$$10^{-2} = .01$$

$$\frac{4}{x^{-3}}$$

$$\frac{4}{\frac{1}{x^3}}$$

$$\frac{4 \cdot x^3}{1 \cdot 1}$$

$$4x^3$$

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

$$\frac{y^3}{x^2}$$

$$\frac{1}{x^2}$$

$$\frac{1}{y^3} \curvearrowright$$

$$\frac{1}{x^2} \cdot \frac{y^3}{y^3}$$

$$\frac{y^3}{x^2}$$

$$1. \frac{4^5}{4^3} = 4^{5-3} = 4^2 = 16$$

$$2. (3^2)^4 = 3^8 = 6561$$

$$3. \frac{7x^2}{x^3} = \frac{7\cancel{x}\cdot\cancel{x}}{\cancel{x}\cdot\cancel{x}\cdot x}$$

$$7x^{-1}$$

$$7 \cdot \frac{1}{x^1}$$

$$\frac{7}{x}$$

$$\left(\frac{7}{x}\right)$$

$$4. \frac{x^n \cdot x^{2n}}{x^{3n}}$$

$$\frac{x^{3n}}{x^{3n}}$$

$$1$$

# Scientific Notation

$$3.6 \times 10^5$$

360000

360,000

.0000000075

$$7.5 \times 10^{-9}$$

Simple Interest  $I = Prt$

$$A = P(1 + rt)$$

$$A = P + Prt$$

Compound Interest

$$A = P \left( 1 + \frac{r}{n} \right)^{nt}$$

$A$  ending amount       $n=1$  annual  
 $P$  Principal             $n=2$  semi-annual  
 $r$  rate decimal         $n=4$  quarterly  
                                   $n=12$  monthly  
 $t$  time in years