

Formulas

Exponent and Log Rules:

$$x^a x^b = x^{a+b}$$

$$e^x e^y = e^{x+y}$$

$$\ln(xy) = \ln(x) + \ln(y)$$

$$\frac{x^a}{x^b} = x^{a-b}$$

$$\frac{e^x}{e^y} = e^{x-y}$$

$$\ln\left(\frac{x}{y}\right) = \ln(x) - \ln(y)$$

$$(x^a)^b = x^{ab}$$

$$(e^x)^y = e^{xy}$$

$$\ln(x^a) = a \ln(x)$$

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

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

$$\sqrt[b]{x^a} = x^{a/b}$$

$$\sqrt[b]{x} = x^{1/b}$$

Remember: $\ln(e^x) = x$ and $e^{\ln(x)} = x$ because $\ln(x)$ and e^x are inverses, but we need “e” and “ln” right next to each other to use this.

For example, $e^{2 \ln(x)} = e^{\ln(x^2)} = x^2$ and $\ln(xe^2) = \ln(x) + \ln(e^2) = \ln(x) + 2$

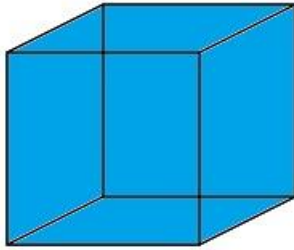
Trig Formulas/Identities:

- $\sec(\theta) = \frac{1}{\cos(\theta)}$
- $\csc(\theta) = \frac{1}{\sin(\theta)}$
- $\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)}$
- $\cot(\theta) = \frac{1}{\tan(\theta)} = \frac{\cos(\theta)}{\sin(\theta)}$

Miscellaneous and Geometric Formulas:

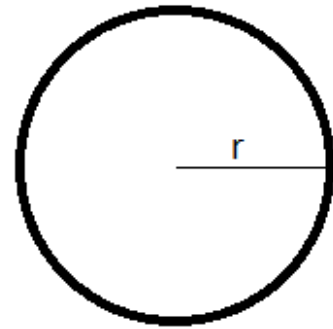
- $Revenue = units\ sold * price\ per\ unit$
- $Profit = units\ sold * (price\ per\ unit - cost\ per\ unit)$
- $Quantity = Rate * Time$

Cube & Formulas



$$\text{area} = 6a^2$$

$$\text{volume} = a^3$$



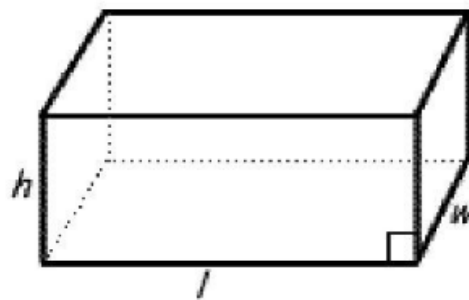
$$\text{Perimeter: } C = 2\pi r$$

$$\text{Area: } A = \pi r^2$$

Rectangular Prism

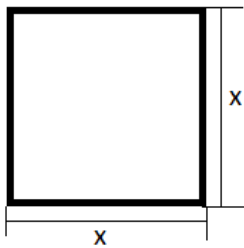
Surface
Area

$$A = 2 (wh + lw + lh)$$



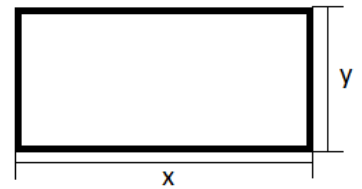
Volume

$$V = lwh$$



$$\text{Perimeter: } P = 4x$$

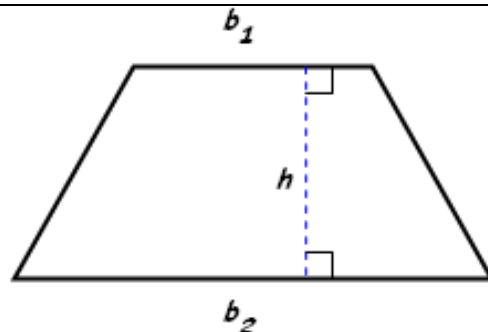
$$\text{Area: } A = x^2$$



$$\text{Perimeter: } P = 2x + 2y$$

$$\text{Area: } A = xy$$

$$A = \frac{1}{2}(b_1 + b_2) \cdot h$$



The Unit Circle

All points (x, y) are $(\cos(\theta), \sin(\theta))$

