

# Mathematics Reference Sheet

## Conversions

### U.S. Customary

1 foot = 12 inches  
1 yard = 3 feet  
1 mile = 5280 feet  
1 acre  $\approx$  43,560 square feet  
1 cup = 8 fluid ounces  
1 pint = 2 cups  
1 quart = 2 pints  
1 gallon = 4 quarts  
1 gallon = 231 cubic inches  
1 pound = 16 ounces  
1 ton = 2000 pounds  
1 cubic foot  $\approx$  7.5 gallons

### U.S. Customary to Metric

1 inch = 2.54 centimeters  
1 foot  $\approx$  0.3 meter  
1 mile  $\approx$  1.61 kilometers  
1 quart  $\approx$  0.95 liter  
1 gallon  $\approx$  3.79 liters  
1 cup  $\approx$  237 milliliters  
1 pound  $\approx$  0.45 kilogram  
1 ounce  $\approx$  28.3 grams  
1 gallon  $\approx$  3785 cubic centimeters

### Time

1 minute = 60 seconds  
1 hour = 60 minutes  
1 hour = 3600 seconds  
1 year = 52 weeks

### Temperature

$$C = \frac{5}{9}(F - 32)$$

$$F = \frac{9}{5}C + 32$$

### Metric

1 centimeter = 10 millimeters  
1 meter = 100 centimeters  
1 kilometer = 1000 meters  
1 liter = 1000 milliliters  
1 kiloliter = 1000 liters  
1 milliliter = 1 cubic centimeter  
1 liter = 1000 cubic centimeters  
1 cubic millimeter = 0.001 milliliter  
1 gram = 1000 milligrams  
1 kilogram = 1000 grams

### Metric to U.S. Customary

1 centimeter  $\approx$  0.39 inch  
1 meter  $\approx$  3.28 feet  
1 kilometer  $\approx$  0.62 mile  
1 liter  $\approx$  1.06 quarts  
1 liter  $\approx$  0.26 gallon  
1 kilogram  $\approx$  2.2 pounds  
1 gram  $\approx$  0.035 ounce  
1 cubic meter  $\approx$  264 gallons

## Number Properties

Commutative Properties of Addition and Multiplication

$$a + b = b + a$$

$$a \cdot b = b \cdot a$$

Associative Properties of Addition and Multiplication

$$(a + b) + c = a + (b + c)$$

$$(a \cdot b) \cdot c = a \cdot (b \cdot c)$$

Addition Property of Zero

$$a + 0 = a$$

Multiplication Properties of Zero and One

$$a \cdot 0 = 0$$

$$a \cdot 1 = a$$

Distributive Property:

$$a(b + c) = ab + ac$$

$$a(b - c) = ab - ac$$

## Properties of Equality

Addition Property of Equality

$$\text{If } a = b, \text{ then } a + c = b + c.$$

Subtraction Property of Equality

$$\text{If } a = b, \text{ then } a - c = b - c.$$

Multiplication Property of Equality

$$\text{If } a = b, \text{ then } a \cdot c = b \cdot c.$$

Multiplicative Inverse Property

$$n \cdot \frac{1}{n} = \frac{1}{n} \cdot n = 1, n \neq 0$$

Division Property of Equality

$$\text{If } a = b, \text{ then } a \div c = b \div c, c \neq 0.$$

## Properties of Inequality

Addition Property of Inequality

If  $a > b$ , then  $a + c > b + c$ .

Subtraction Property of Inequality

If  $a > b$ , then  $a - c > b - c$ .

Multiplication Property of Inequality

If  $a > b$  and  $c$  is positive, then  $a \cdot c > b \cdot c$ .

If  $a > b$  and  $c$  is negative, then  $a \cdot c < b \cdot c$ .

Division Property of Inequality

If  $a > b$  and  $c$  is positive, then  $a \div c > b \div c$ .

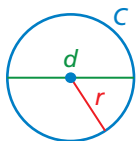
If  $a > b$  and  $c$  is negative, then  $a \div c < b \div c$ .

## Circumference and Area of a Circle

$$C = \pi d \text{ or } C = 2\pi r$$

$$A = \pi r^2$$

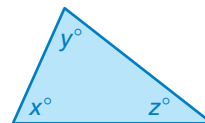
$$\pi \approx \frac{22}{7}, \text{ or } 3.14$$



## Angles of Polygons

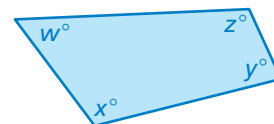
Sum of the Angle Measures of a Triangle

$$x + y + z = 180$$



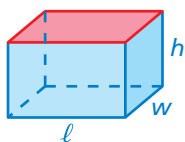
Sum of the Angle Measures of a Quadrilateral

$$w + x + y + z = 360$$

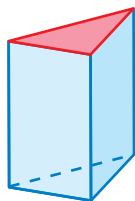


## Surface Area

Prism

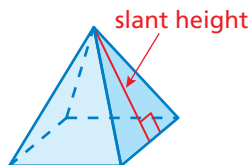


$$S = 2lw + 2lh + 2wh$$



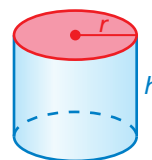
$$S = \text{areas of bases} \\ + \text{areas of lateral faces}$$

Pyramid



$$S = \text{area of base} \\ + \text{areas of lateral faces}$$

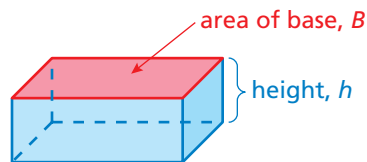
Cylinder



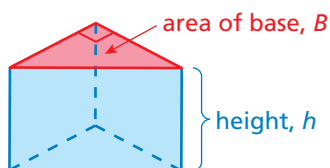
$$S = 2\pi r^2 + 2\pi rh$$

## Volume

Prism

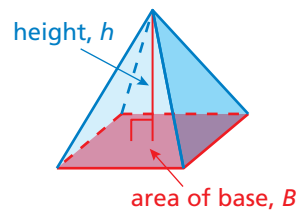


$$V = Bh$$



$$V = Bh$$

Pyramid



$$V = \frac{1}{3}Bh$$

## Simple Interest

Simple interest formula

$$I = Prt$$

