FORMULAS
PRE-ALGEBRA

Real Numbers	$\mathbb{R}$	
Natural	$\mathbb{N}$	$1, 2, 3, 4, 5, \ldots$
Whole	$\mathbb{W}$	$0, 1, 2, 3, 4, 5, \ldots$
Integers	$\mathbb{Z}$	$\ldots -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, \ldots$
Rational	$\mathbb{Q}$	$\frac{1}{2}, .33\overline{3}$ $(fractions\ and\ all\ terminating\ and\ repeating\ decimals)$
Irrational		$\pi, \sqrt{2}, .121121112$ $(all\ non-terminating\ and\ non-repeating\ decimals)$
Imaginary	i	

Conversions: Fractions to Decimals

$\frac{1}{2} = .5$

$\frac{1}{4} = .25$ $\frac{3}{4} = .75$

$\frac{1}{5} = .2$ $\frac{2}{5} = .4$ $\frac{3}{5} = .6$ $\frac{4}{5} = .8$

$\frac{1}{8} = .125$ $\frac{3}{8} = .375$ $\frac{5}{8} = .625$ $\frac{7}{8} = .875$

Conversions:

Distance
1 foot: 12 inches
1 inch: 2.54 centimeters
1 yard: 3 feet
1 mile: 5280 feet
1 mile: 1760 yards
1 mile: 1.6 kilometers
1 kilometer: 1000 meters
1 meter: 100 centimeters
1 meter: 39.3701 inches

Weight (Mass)
1 kilogram: 1000 grams
1 kilogram: 2.2 pounds
1 pound: 16 ounces

Liquid
2 cups: 1 pint
2 pints: 1 quart
4 quarts: 1 gallon
1 liter ~ 1 quart

Computer Storage

1 TB: 1000 GB	a lot
1 GB: 1000 MB	~25 minute video file
1 MB: 1000 KB	~a medium-size .jpeg
1 KB: 1000 B	a short essay
1 B: 8 bits	one character

multiplying exponents
$x^a(x^b) = x^{a+b}$

raising an exponent by an exponent
$(x^a)^b = x^{ab}$

scientific notation
$1{,}234 \Rightarrow 1.234 \times 10^3$

percent proportion
$\frac{a}{b} = \frac{p}{100}$

simple interest formula
$I = prt$

compound interest
$A(t) = Pe^{rt}$

percentage change
$\Delta\% = \frac{V_2 - V_1}{V_1}$

relative error
$RE = \frac{|EV - AV|}{AV}$

slope
$m = \frac{y_2 - y_1}{x_2 - x_1}$

direct variation
$y = kx$

slope-intercept
$y = mx + b$

point-slope
$y - y_1 = m(x - x_1)$

standard form of a linear equation
$Ax + By = C$

Pythagorean Theorem
$a^2 + b^2 = c^2$

distance on a coordinate plane
$d = \sqrt{(x_2 - x_1) + (y_2 - y_1)}$

Surface Area of a Prism
$S.A. = P_B h + 2A_B$
where A_B is equal to $\frac{1}{2}bh$, s^2, bh, or $\frac{1}{2}ap$

Volume of a Prism
$V = A_B h$
where A_B is equal to $\frac{1}{2}bh$, s^2, bh, or $\frac{1}{2}ap$

Lateral Area of a Cylinder
$L.A. = 2\pi rh$ or $L.A. = \pi dh$

Surface Area of a Cylinder
$S.A. = 2\pi rh + 2\pi r^2$

Volume of a Cylinder
$V = \pi r^2 h$

Lateral Area of a Cone
$L.A. = \pi rl$

Surface Area of a Cone
$S.A. = \pi rl + \pi r^2$

Volume of a Cone
$V = \frac{1}{3}\pi r^2 h$

Surface Area of a Sphere
$S.A. = 4\pi r^2$

Volume of a Sphere
$V = \frac{4}{3}\pi r^3$

absolute value
$|x| = x \; and \; -x$