Probability : $And = Multiply$
$OR = Add$

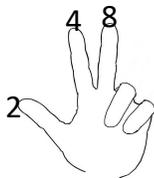## Same Plus   Different Minus

$+ \times + = +$ $+ \times - = -$
$- \times - = +$ $- \times + = -$
$+ \div + = +$ $+ \div - = -$
$- \div - = +$ $- \div + = -$

Algebra $a + 1 = a + 1$

Can't add or subtract unlike terms.
Can only add or subtract like terms.

Coefficients/Fractions/Exponents

Every Number is Over "1." $4 = \dfrac{4}{1}$

$$-\frac{2}{3} = \frac{-2}{3} = \frac{2}{-3} \neq \frac{-2}{-3} = +\frac{2}{3}$$

$$\frac{1}{3} + \frac{2}{2} \neq \frac{\mathbf{1 + 2}}{\mathbf{3 + 2}}$$

$$\frac{x}{2} = \frac{1x}{2} = \frac{1}{2}x = \frac{1}{2} \times x \neq \frac{1}{2x}$$

$$x + x = 2x \quad 2 \times x = 2(x) = 2x = x \cdot 2$$
$$x \times x = x^2 \quad 2 \times 3 = 2(3) = 6$$

$$1 \times x = 1x = x = \frac{1x^1}{1}$$
$$-x = -1x$$
$$x^2 = 1x^2$$

$3 = 3^1$
$2^0 = 1$
$5 = 5x^0$

Place Value

Ones
Hundreds $\rightarrow$ $\leftarrow$ Hundredths
Thousands $\rightarrow$ **3742.347** $\leftarrow$ Thousandths
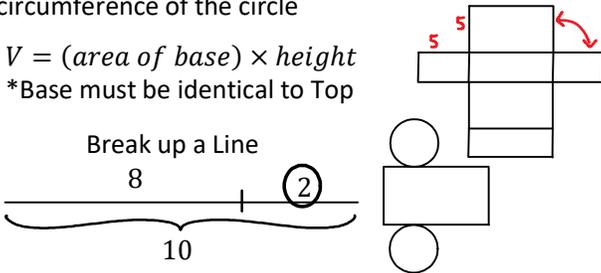Tens $\nearrow$ $\nwarrow$ Tenths

$3742.347 = 3000 + 700 + 40 + 2 + 0.3 + 0.04 + 0.007$

Geometry: (Units)

Adjacent sides of net areas are the same length.
The width of rectangle in the cylinders net area is the
circumference of the circle

$V = (area\ of\ base) \times height$
*Base must be identical to Top

Break up a Line
8   (2)
10

$\dfrac{0}{8} = \boxed{0}$ Calculator!

$\dfrac{8}{0} \neq 0$ $\boxed{\text{Undefined}}$

Cross Multiply
$\dfrac{6}{3} = 2$ Switch 2
$\dfrac{6}{2} = 3$ and 3

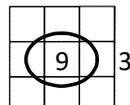**Pythagoras: Right Angle Triangles** 90°
"c" is always the hypotenuse, the longest side
Biggest square $-$ Smaller square $=$ Other Smaller square.

Ratios
Part-to-Part   Odds - Part:Part
Part-to-Total   % - Part:Total

Square Roots (Radicals)
$3 \times 3 = 9$ The area of a square with side lengths 3 is 9.
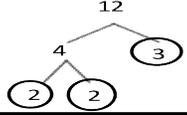$\sqrt{9} = 3$ The square root of 9 is 3.

$\sqrt{-9} = \boxed{undefined}$ $\sqrt[3]{-8} = \boxed{-2}$
Can't square/even root a negative

Exponent : Do not multiply
the base by the exponent!

$15\%\ fewer\ doesn't\ mean\ 0.15x$
$It\ means\ 85\% = (1 - 0.15)x = 0.85x$

Factor trees: You will always end up
with the same prime factors

12
4   3
2   2

Goes into
2 : Even 0,2,4,6,8
3 : Digits add to multiples of 3
5 : Ends in 5 or 0
7,11,13…: Long Division

Graphing: TOV! Watch out for increments

Calculator:
$\dfrac{(2 + 3)}{(4 + 6)} = \dfrac{5}{10} = \boxed{\dfrac{1}{2}}$

Brackets around the Top,
Brackets around the Bottom,
Divide on your Calculator
(Or do Top then Bottom)

$"The\ sum\ of\ 2 + 3\ "All"\ over\ the\ sum\ of\ 4 + 6"$

$$speed = \frac{distance}{time} \quad s = \frac{d}{t} \quad s = \frac{500km}{hr}$$

$$rate = \frac{quantity}{quantity} \quad \text{Unit Rate:} = \frac{\#}{1}$$

$\dfrac{200}{4 \times 5} = 200 \div 4 \div 5 = \boxed{10}$ $\dfrac{200}{(4 \times 5)} = \boxed{10}$ $\dfrac{200}{4} \times 5 = \boxed{250}$

Scientific Notation: $6.02 \times 10^3 = 6020$