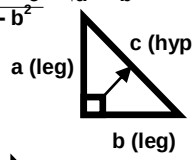
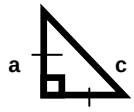
PYTHAGOREAN THEOREM ($a^2 + b^2 = c^2$)

Finding Hypotenuse: $c = \sqrt{a^2 + b^2}$
Finding Leg: $a = \sqrt{c^2 - b^2}$

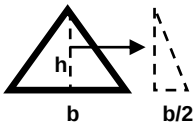


Isosceles Triangles

$2a^2 = c^2$

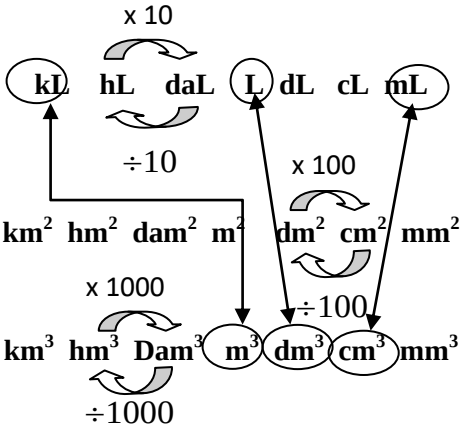


Equilateral Triangles



Multi-Step Triangles
1. Find the RIGHT triangles
2. Calculate missing sides
3. Plug info into original image
4. Solve

UNITS OF AREA



AREA

CUBE: $A_L = 4s^2$ $A_T = 6s^2$

PRISM: $A_L = P_b \times H$

$A_T = 2A_b + A_L$

CYLINDER: $A_L = P_b \times H$
*Circumference (P_b)= $2\pi r$ or πd
$A_T = 2A_b + A_L$
*Area (A_b)= πr^2

PYRAMID: $A_L = \frac{P_b \times sh}{2}$
$A_T = A_b + A_L$

CONE: $A_L = \pi(r)(sh)$
$A_T = A_b + A_L$
$(A_b) = \pi r^2$

SPHERE: $A_T = 4\pi r^2$ HEMI: $A_L = 2\pi r^2$

Volume

CUBE: $V = s^3$

PRISM: $V = A_b \times H$

CYLINDER: $V = \pi r^2 \times H$

PYRAMID: $V = \frac{A_b \times H}{3}$

CONE: $V = \frac{\pi r^2 \times H}{3}$

SPHERE: $V = \frac{4\pi r^3}{3}$ HEMI: $V = \frac{2\pi r^3}{3}$

ISOMETRICS

Scale Factor = $\frac{image}{original}$

K = Lengths & Perimeter

K^2 = Area --> $k = \sqrt{k^2}$

K^3 = Volume --> $k = \sqrt{k^3}$

GEOMETRIC PROBABILITY

Probability = $\frac{DesirableOutcome}{TotalOutcome}$

Exponent RULES

$a^0 = 1$

$a^1 = a$

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

$a^m \div a^n = a^{m-n}$

$(a^m)^n = a^{m \cdot n}$

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

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

$a^{m/n} = \sqrt[n]{a^m}$

POLYNOMIALS

Adding/Subtracting Polynomials:
1. Distribute negative into bracket
2. Group "like terms"
3. Simplify

Ex: $(4xy^2 - 3x - 7) - (xy^2 - x + 3)$
$= 4xy^2 - 3x - 7 - xy^2 + x - 3 = 3xy^2 - 2x - 10$

Multiplying/Dividing Polynomial:
1. Distribute monomial into bracket
2. Group "like" terms
3. Simplify

Ex: $-3x^2(4x - 3xy^4 + 2) = -12x^3 + 9x^3y^4 - 6x^2$

***Identities:** (FOIL)

Ex: $(2x + 3)(5x - 2) = 10x^2 + 11x - 6$

$(x - 4)^2 = (x - 4)(x - 4) = x^2 - 8x + 16$

Removing Common factor
1. Greatest Common Factor
2. Divide factor into each term
3. Simplify

Ex: $18x^2y^3 - 24x^3y^2 + 12x^4y^2 = 6x^2y^2(3y - 4x - 2x^2)$

SCIENTIFIC NOTATION

1. **Digit Term**: Single digit decimal form (without zeros)
2. **Exponential Term of 10**: Number of places the decimal moves to give the number in LONG form.

Positive – move to the right

Negative – move to the left

Example:

$2563000 = 2.563 \times 10^6$

$0.000012 = 1.2 \times 10^{-5}$

Linear Functions

Rule: **y= ax + b**
(a=rate of change) (b=initial value)

Finding the Rule

1. **Rate of Change "a"** $\frac{y_2 - y_1}{x_2 - x_1}$
2. **Initial Value "b"**
-REPLACE a point (x,y) into rule
-Solve for "b"

OR b = y - a(x)

i.e.: A(6, 7) and B(15, 25)

1) $\frac{25 - 7}{15 - 6} = \frac{18}{9} = 2$
[y = 2x + b]
2) **7** = 2**(6)** + b
7 = 12 + b
7-12 = b
b **= -5**
3) **y = 2x -5**

System of Equations
COMPARISON METHOD

$y=-8x+1000$
$y=-12x+1200$

$-8x+1000=-12x+1200$
$-8x+\mathbf{12x}=1200-\mathbf{1000}$
$4x=200$
$x=200\div\mathbf{4}$
$x=50$

$y=-8\mathbf{(50)}+1000=600$

Solution Set (50,600)

CENTRAL TENDENCY

MEAN - Average $\frac{SumOfData}{\#ofData}$

MODE - Most **frequent** value

MEDIAN - Middle value

*Place values in **increasing order**

RANGE- Subtract largest & smallest value