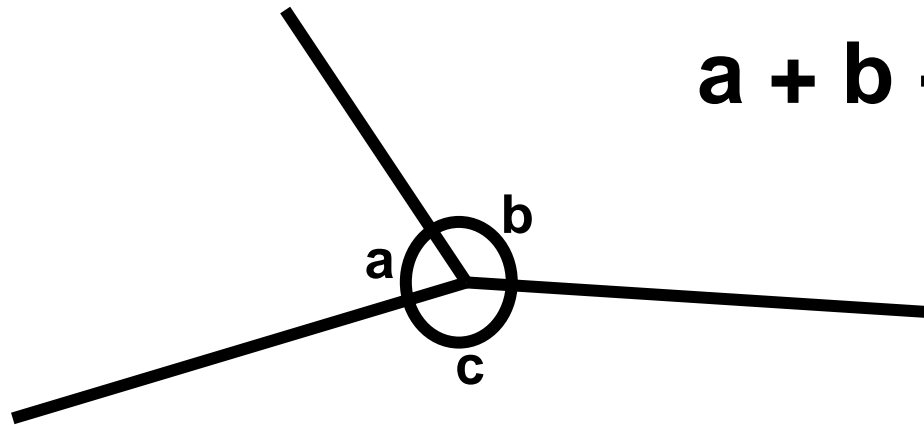


# Angles on a Point

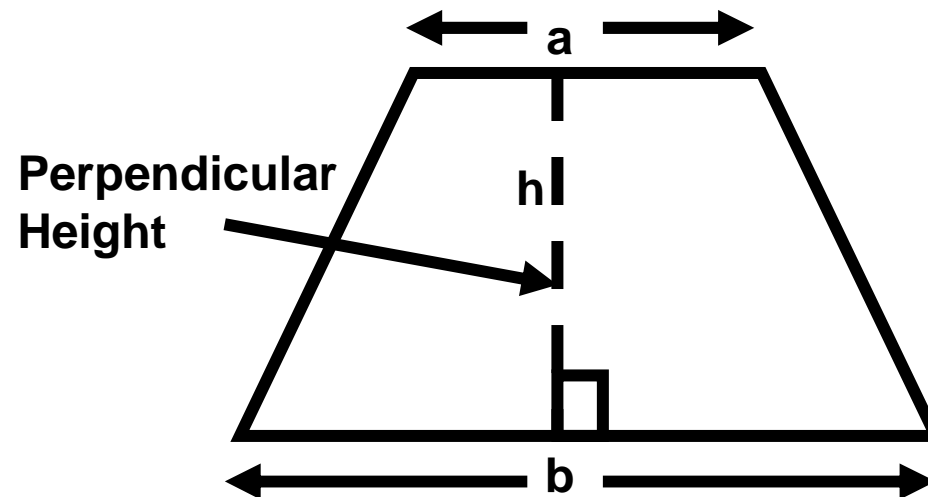
- **Always add up to  $360^\circ$**



$$a + b + c = 180^\circ$$

# Area of a Trapezium

- **Add the parallel sides, multiply by the perpendicular height, then divide by 2. Formula is  $\frac{1}{2}(a+b)h$**



# **Time**

**60 seconds = 1 minute**

**60 minutes = 1 hour**

**24 hours = 1 day**

**7 days = 1 week**

**365 days = 1 year**

**366 days = 1 leap year**

# **Metric Measures**

**10 millimetres = 1 centimetre**

**100 centimetres = 1 metre**

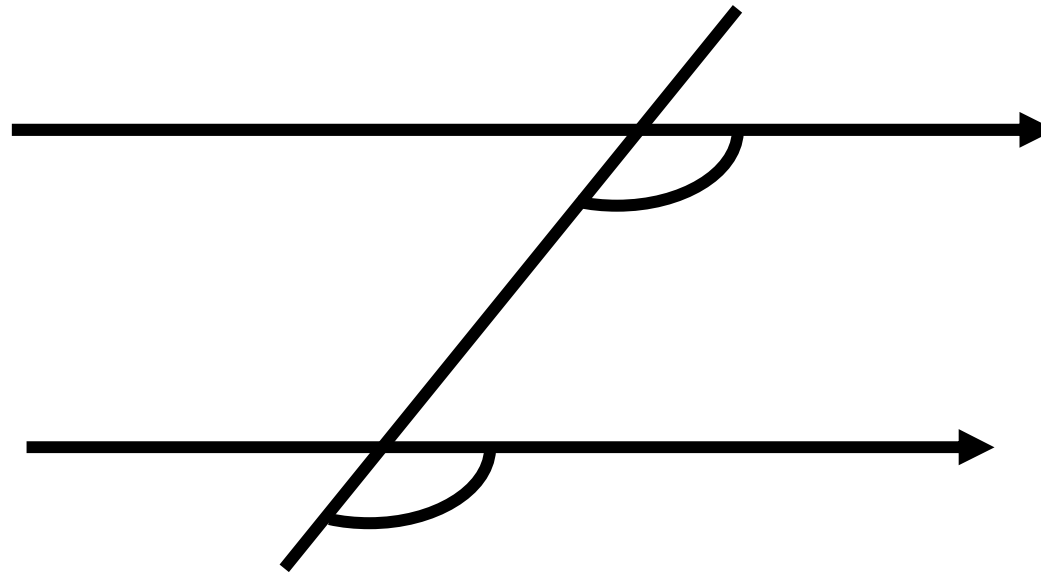
**100 metres = 1 Kilometre**

# Triangular Numbers

- **A number which can be drawn by a triangle of dots. Add 1 to the difference between the last two terms to make the next term.**
- **1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78, 91, 105, . . .**

# Corresponding Angles

- **Known as “F” angles**
- **They are always equal**



# Inequalities

**$a > b$      $a$  is greater than  $b$**

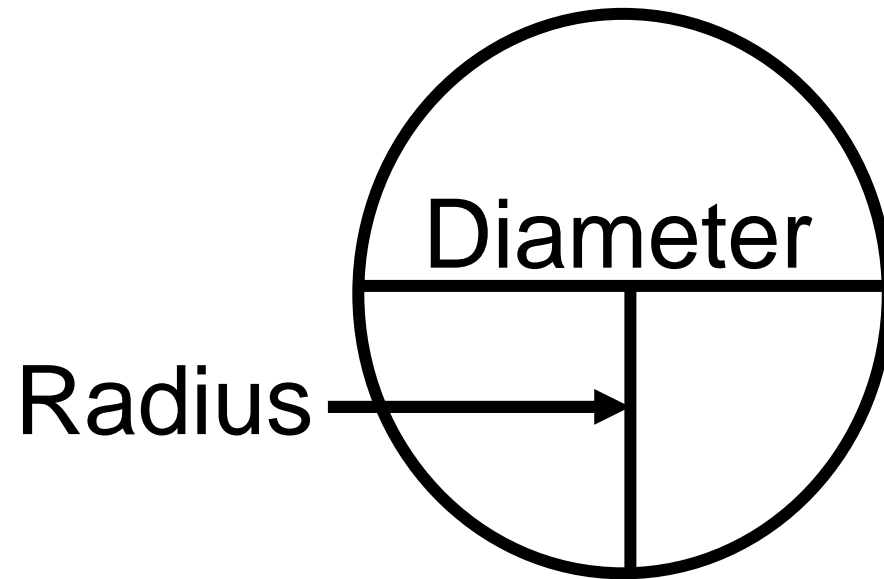
**$a < b$      $a$  is less than  $b$**

**$a \geq b$      $a$  is greater than or equal  
to  $b$**

**$a \leq b$      $a$  is less than or equal to  $b$**

# Circumference of a Circle

- **Circumference = pi × diameter**
- **Circumference = 2 × pi × radius**
- **$C = \pi d$**
- **$C = 2\pi r$**





$$\mathbf{Pi = \pi}$$

- $\pi$  is a never ending number that never repeats.
- **Pi = 3.1415926535897932384626  
4338327950288419716939937510  
5820974944592307816406286208  
9986280348253421170679821480  
8651328230664709384460955058  
2231725359408128481117450.....**

# **Imperial Weights**

**16 ounces (oz) = 1 pound (lb)**

**14 pounds = 1 stone**

**112 pounds = 1 hundredweight**

**2240 pounds = 1 ton**

# **BEDMAS**

**B = Brackets**

**E = Exponents**

**D = Division**

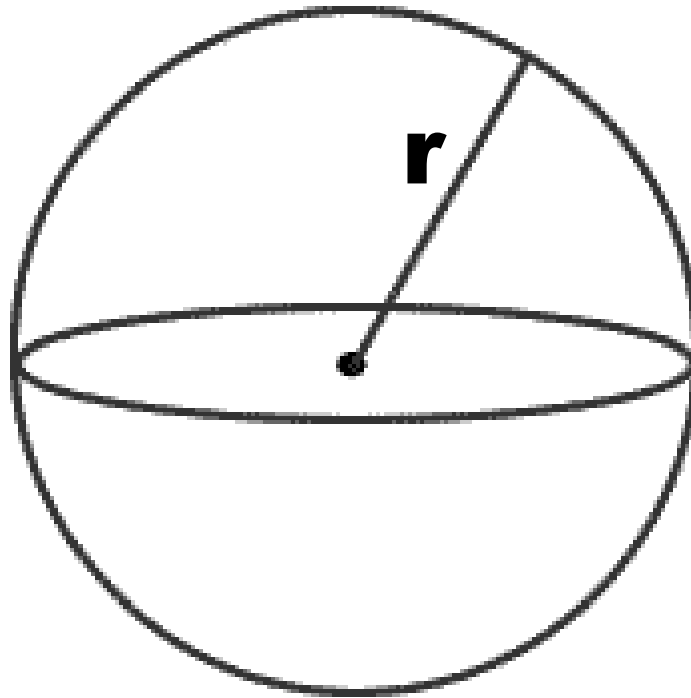
**M = Multiplication**

**A = Addition**

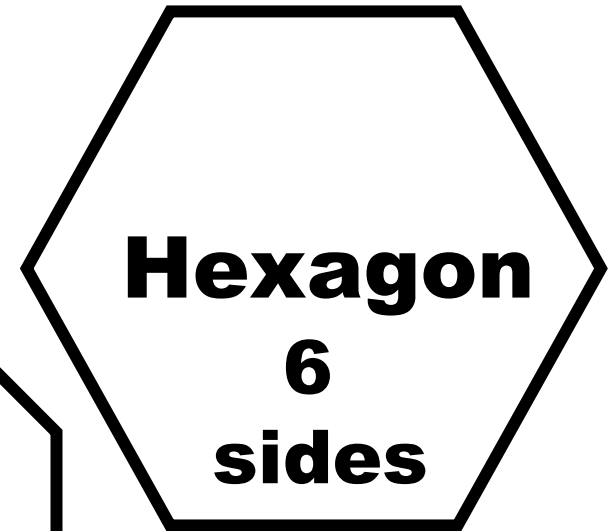
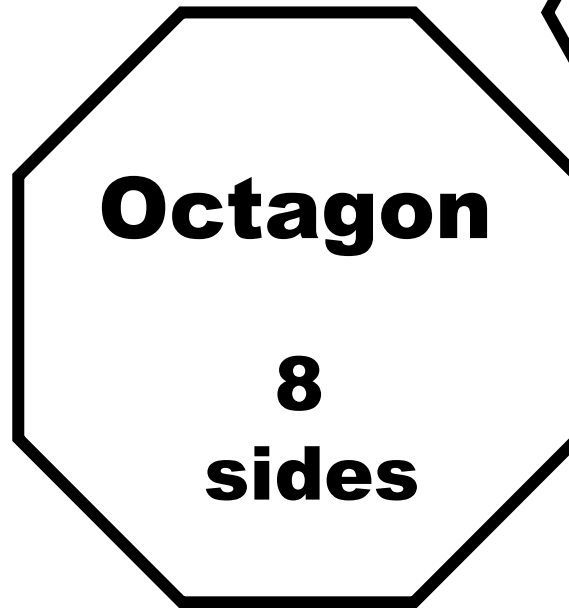
**S = Subtraction**

# Volume of a Sphere

$$\text{Volume} = \frac{4}{3} \times \pi \times r^3$$

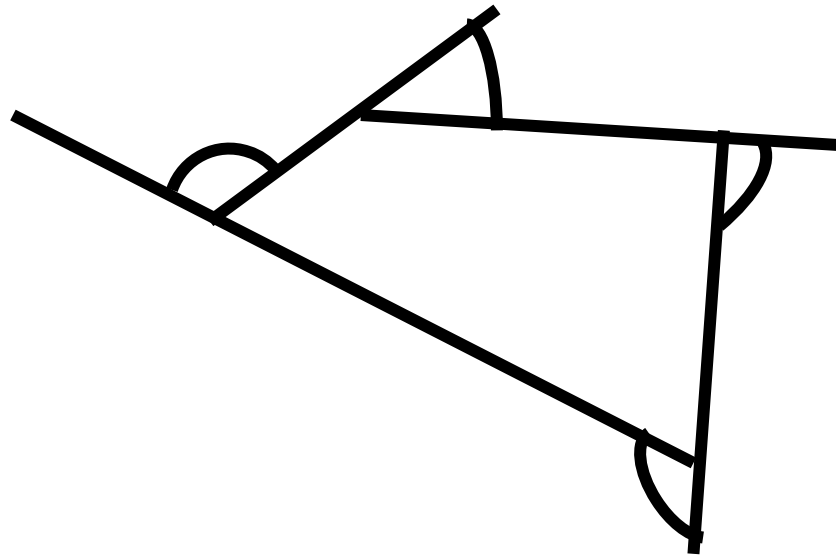


# Shape Names



# External Angles

- **The sum of external angles on any polygon always add up to  $360^\circ$**

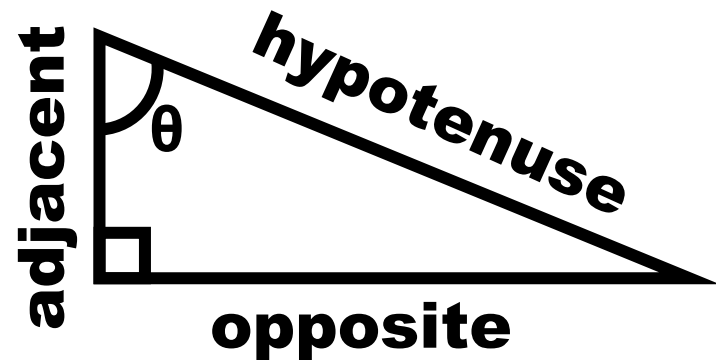
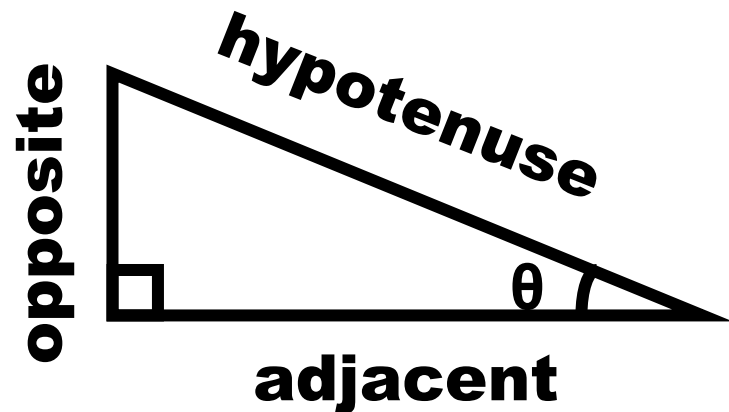


# SOH-CAH-TOA

$$\sin \theta = \frac{\textit{opposite}}{\textit{hypotenuse}}$$

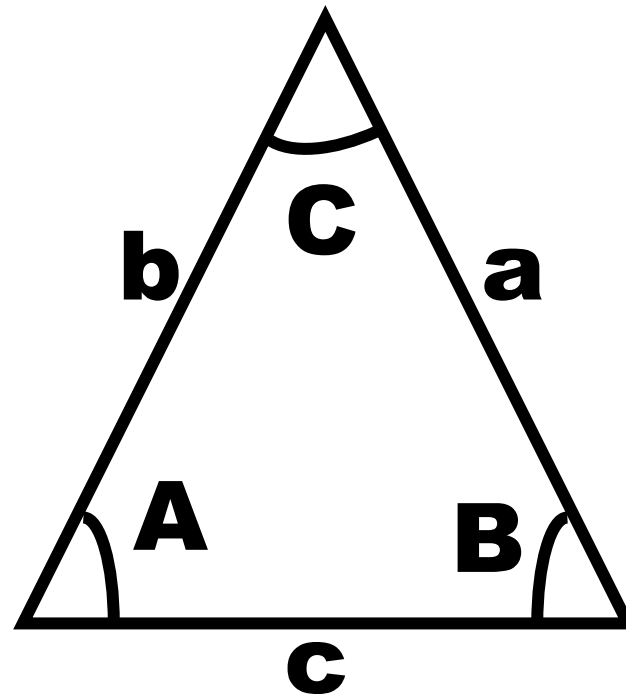
$$\cos \theta = \frac{\textit{adjacent}}{\textit{hypotenuse}}$$

$$\tan \theta = \frac{\textit{opposite}}{\textit{adjacent}}$$



# Cosine Rule

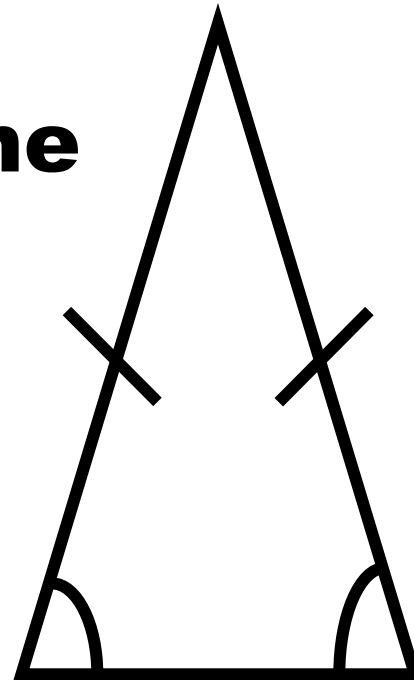
$$a^2 = b^2 + c^2 - 2bc \times \text{Cos}A$$





# Isosceles Triangle

- **2 Sides are the same**
- **2 Angles are the same**



# Parallelogram

- **Opposite sides are the same length**
- **Opposite angles equal**
- **Opposite sides parallel**



# 12/24 hour time

0100 = 1.00 am

0200 = 2.00 am

0300 = 3.00 am

0400 = 4.00 am

0500 = 5.00 am

0600 = 6.00 am

0700 = 7.00 am

0800 = 8.00 am

0900 = 9.00 am

1000 = 10.00 am

1100 = 11.00 am

1200 = 12.00 am

1300 = 1.00 pm

1400 = 2.00 pm

1500 = 3.00 pm

1600 = 4.00 pm

1700 = 5.00 pm

1800 = 6.00 pm

1900 = 7.00 pm

2000 = 8.00 pm

2100 = 9.00 pm

2200 = 10.00 pm

2300 = 11.00 pm

2400 = 12.00 pm

# Logarithms

$$\log_a a^b = b$$

$$\log_a (bc) = \log_a b + \log_a c$$

$$\log_a \left(\frac{a}{b}\right) = \log_a(b) - \log_a(c)$$

$$\log_a (b^c) = c \log_a(b)$$

$$\log_a b = \frac{\log_c b}{\log_c a}$$

# **Dimensions**

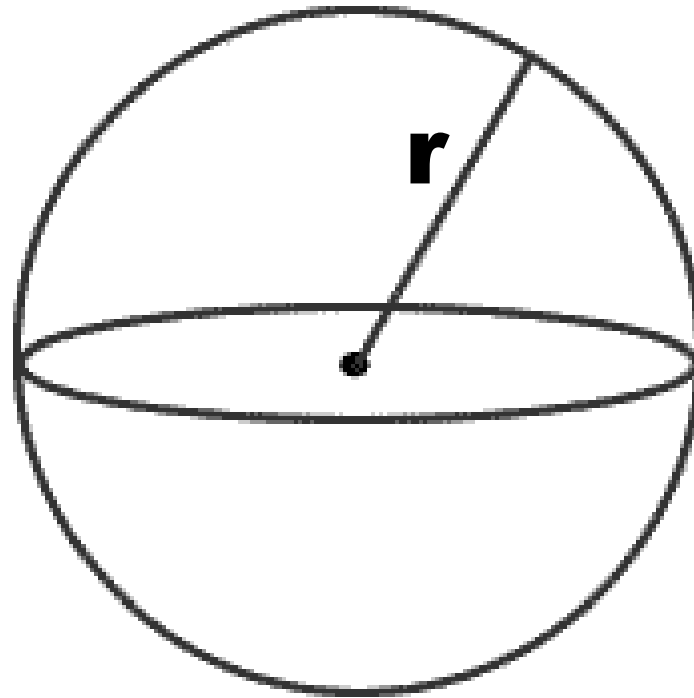
**Length = units**

**Area = units<sup>2</sup>**

**Volume = units<sup>3</sup>**

# Surface Area of a Sphere

$$\text{Surface area} = 4 \times \pi \times r^2$$



# **Metric Capacity**

**1000 millilitres (ml) = 1 litre (l)**

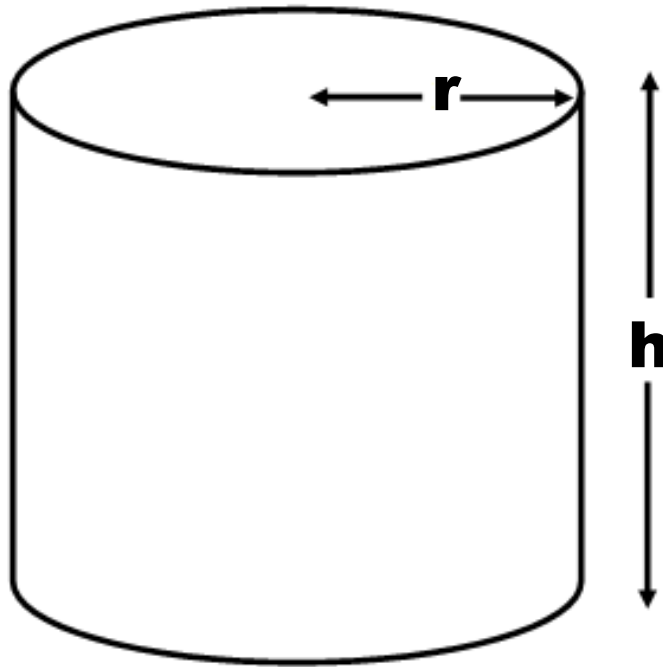
**1000 cm<sup>3</sup> = 1 litre**

**1000 cc = 1 litre**

**1000 litres = 1 metre<sup>3</sup>**

# Volume of a Cylinder

$$\text{Volume} = \pi r^2 h$$

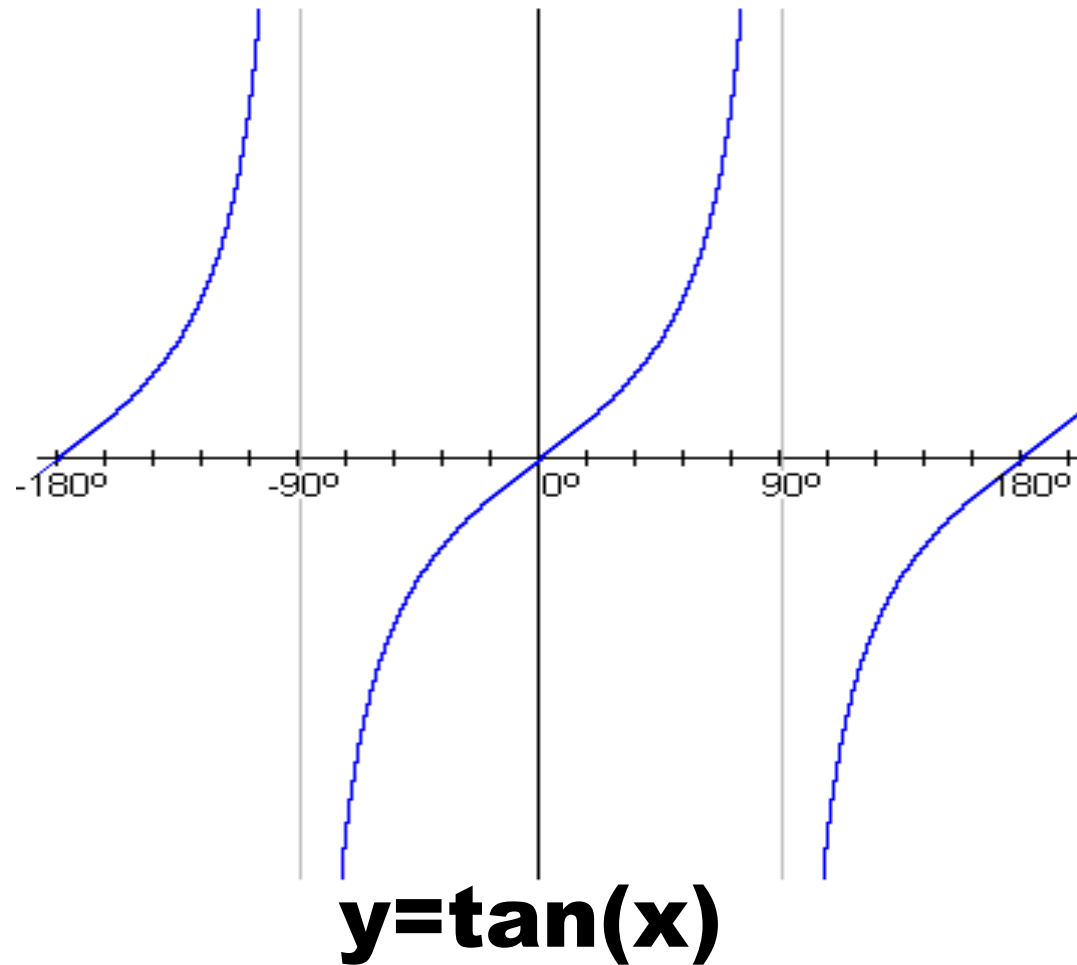




# Mode

- **The number (or data item) that occurs the most.**
- **Example : 8 4 8 5 2 9 8**
- **Answer : The Mode is 8**

# Tangent Curve



# Negative Numbers

## Multiplication

$$+ \times + = +$$

$$+ \times - = -$$

$$- \times + = -$$

$$- \times - = +$$

## Division

$$+ \div + = +$$

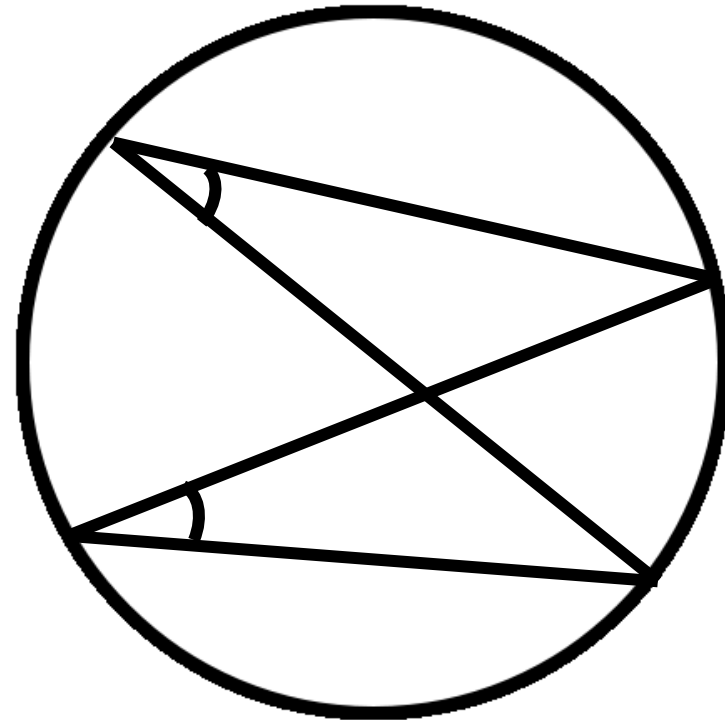
$$+ \div - = -$$

$$- \div + = -$$

$$- \div - = +$$

# Angles Subtended on the Same Arc

- **The angles at the circumference subtended by the same arc are equal**

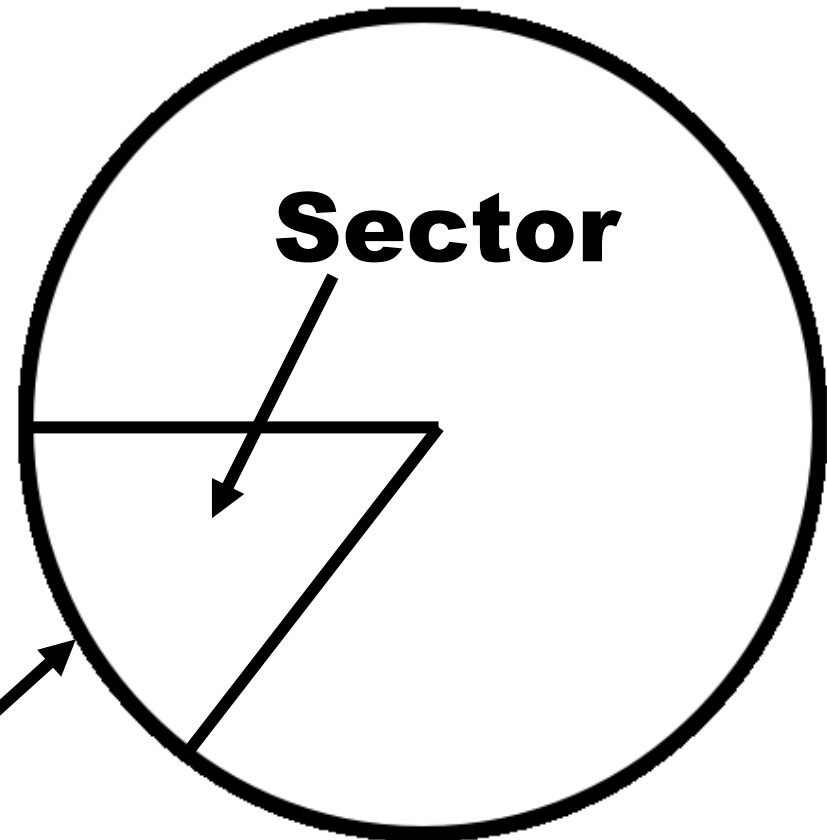


# Arc and Sector

- **Arc = a part of the circumference of a circle**

- **The part of a circle made by two radii and the included arc.**

**arc**



# **GCF**

## **Greatest Common Factor**

- **This is the biggest number that goes into two or more numbers**
- **Example HCF of 12 and 20 is 4**

# **LCM**

## **Lowest Common Multiple**

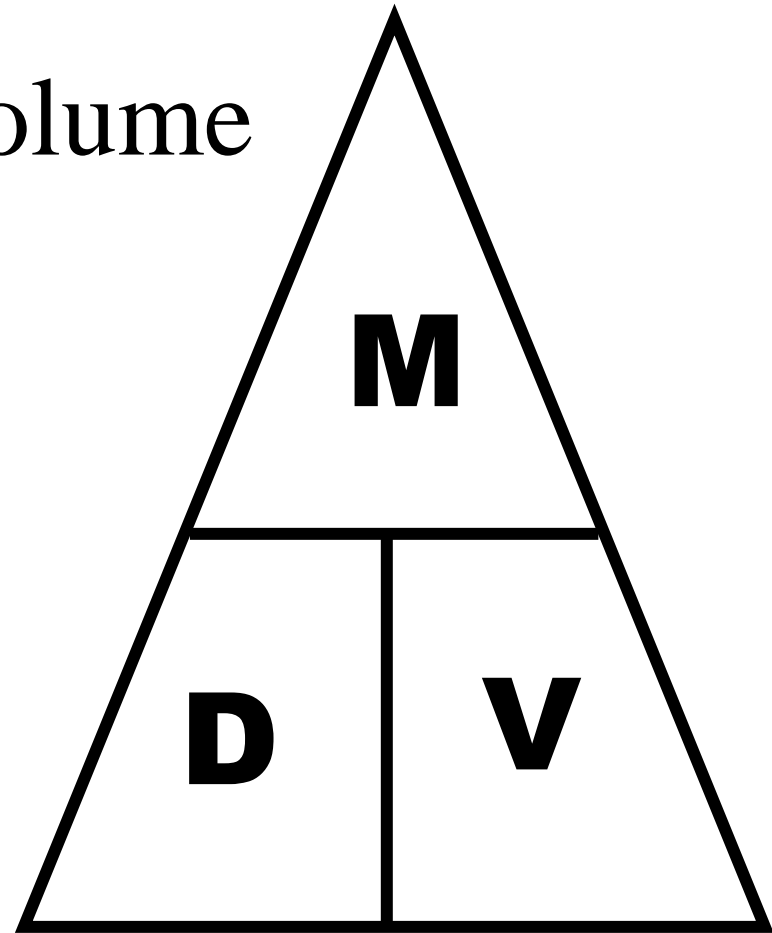
- **This is the smallest number that two or more numbers go into**
- **Example LCM of 12 and 20 is 60**

# Mass Density Volume

$$\text{Mass} = \text{Density} \times \text{Volume}$$

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

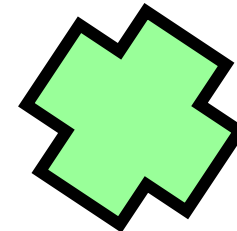
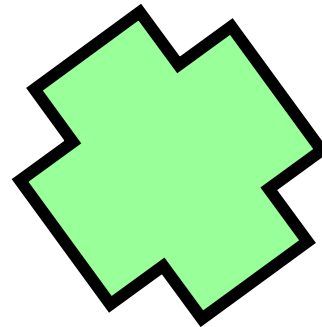
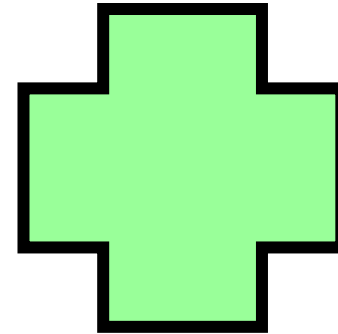
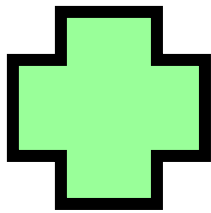
$$\text{Volume} = \frac{\text{Mass}}{\text{Density}}$$





# Similar Shapes

- **Shapes are exactly the same, but are different sizes.**



# Compound Interest

- **A = Total Amount**

- **P= Original Investment**

- **R= Percentage Rate per annum**

- **T= Time in years**

$$A = P \left( 1 + \frac{R}{100} \right)^T$$

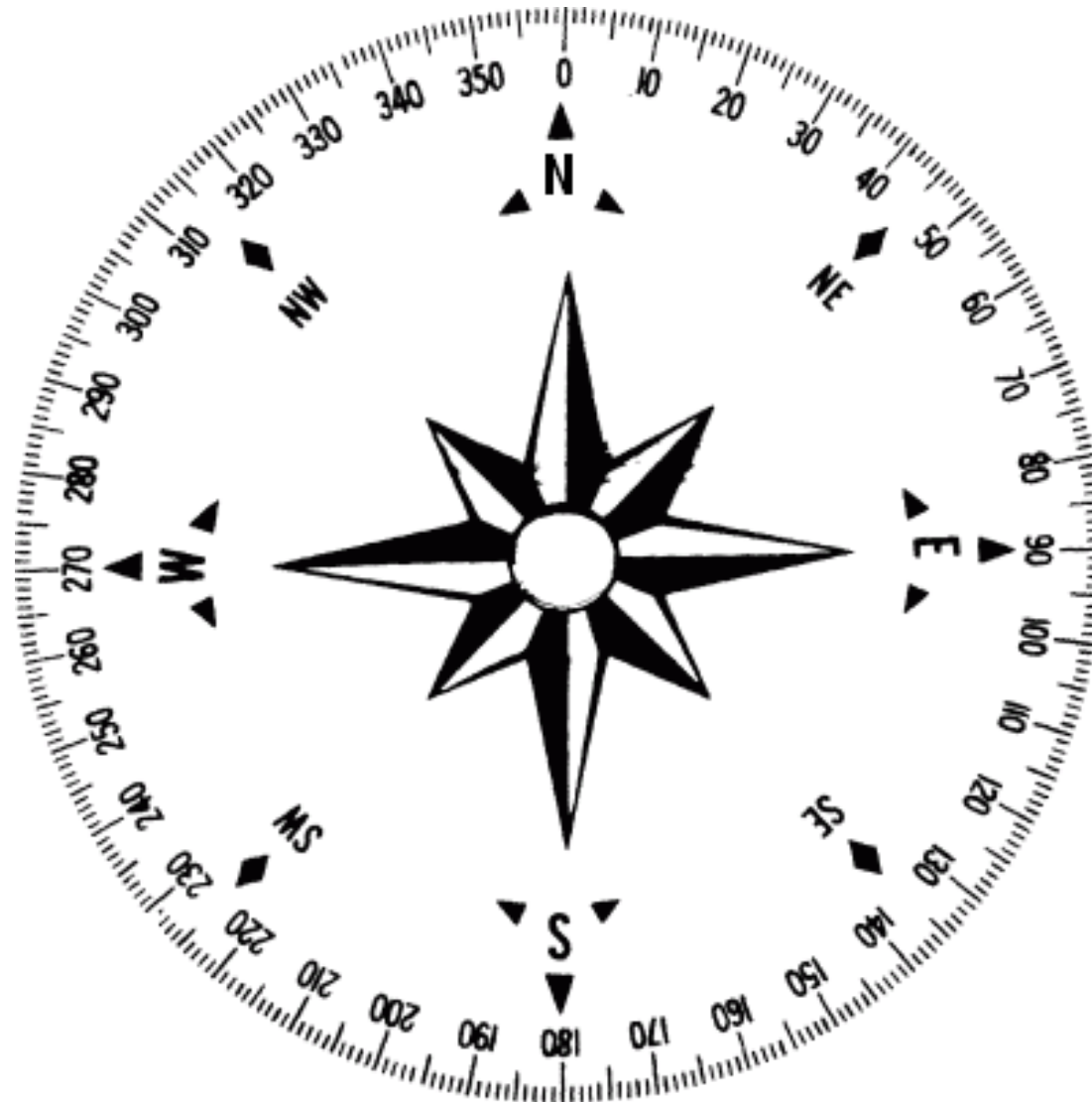
# Inverse Proportion

- **As one variable increases, so the other variable decreases.**
- **As one variable decreases, so the other variable increases.**
- **If  $y$  is inversely proportional to  $x$  then**

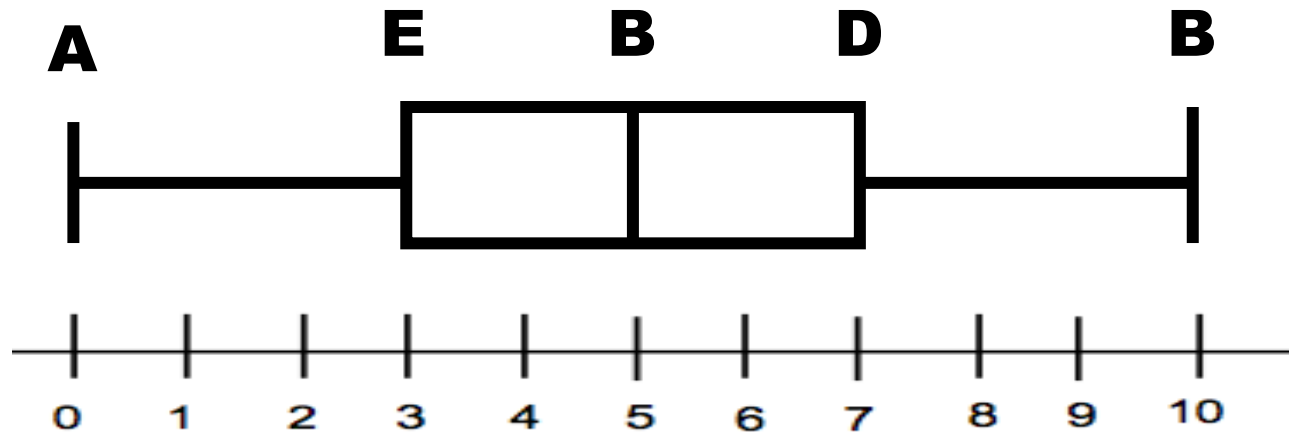
$$y \propto \frac{1}{x} \quad \text{or} \quad y = \frac{k}{x}$$

- **$k$  = constant of proportionality**

# Compass Directions



# Box Plots



**Minimum (A) = 0**

**Maximum (B) = 10**

**Median (C) = 5**

**Upper Quartile (D) = 7**

**Lower Quartile (E) = 3**

# Decimals to Percentages

- **Multiply the decimal number by 100**

$$0.25 \times 100 = 25\%$$

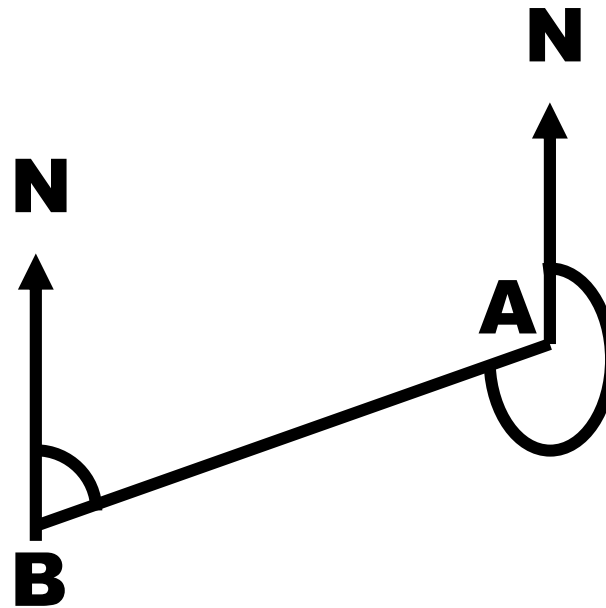
$$0.5 \times 100 = 50\%$$

$$0.07 \times 100 = 7\%$$

$$1.23 \times 100 = 123\%$$

# Bearing

- **This is the angle, measured clockwise from the north. The bearing of B from A is  $230^\circ$ . The bearing of A from B is  $050^\circ$ . It always has to have 3 digits.**



# Mutually Exclusive Events

- **Two events are mutually exclusive if they cannot occur at the same time (i.e., you cannot throw a 4 and a prime number on a single dice at the same time).**

$$P(A \text{ or } B) = P(A) + P(B)$$



# Variance

- **Population variance is where  $\mu$  = mean and N = number of items**

$$\sigma^2 = \frac{\sum (X - \mu)^2}{N}$$

- **Sample variance is where M = mean of sample**

$$s^2 = \frac{\sum (X - M)^2}{N - 1}$$

# **Systematic Sampling**

- **This is where you take every  $n^{\text{th}}$  one in the list.**
- **Example : You have 300 names and you want 30 as your sample.**

**$300 \div 30 = 10$ . This means you take every  $10^{\text{th}}$  one.**

# Matrix Subtraction

- **Matrices of the same dimension can be subtracted. Subtract the corresponding elements.**

$$\begin{pmatrix} 5 & 3 \\ 6 & 2 \\ 4 & 1 \end{pmatrix} - \begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix} = \begin{pmatrix} 4 & 1 \\ 3 & -2 \\ -1 & -5 \end{pmatrix}$$

# Geometric Formulae

- Find a term use

$$a_n = ar^{n-1}$$

- where  
**a=first term**  
**r=common ratio**  
**n=term needed**

- Find a sum use

$$S_n = \frac{a(1-r^n)}{1-r}$$

- where  
**a=first term**  
**n=term needed**  
**r=common ratio**

# Number Sets

- $\mathbb{Z}$  is the set of integers, where
  - $\mathbb{Z}^+$  is only the positive integers
  - $\mathbb{Z}^-$  is only the negative integers
- $\mathbb{N}$  represents the set of natural numbers
- $\mathbb{R}$  represents the set of real numbers
- $\mathbb{Q}$  represents the set of rational numbers

# Solving Multiplication Equations

- **Take the number multiplying the letter to the other side of the equation and make it a divide**

**Example :**      $2x = 6$

$$x = 6 \div 2$$

$$x = 3$$