GCSE FOUNDATION KNOWLEDGE ORGANISER

First 10 prime numbers

2, 3, 5, 7, 11, 13, 17, 19, 23, 29

First 15 square numbers

1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225

First 5 cube numbers

1, 8, 27, 64, 125

Equivalent FDP

Fraction	Decimal	%
1/10	0.1	10%
1/5	0.2	20%
1/4	0.25	25%
1/3	$0.\dot{3}$	$33.\dot{3}$
1/2	0.5	50%
3/4	0.75	75%

Units of time

1 minute	**60 seconds**
1 hour	**60 minutes**
1 hour	**3600 seconds**

Units of length

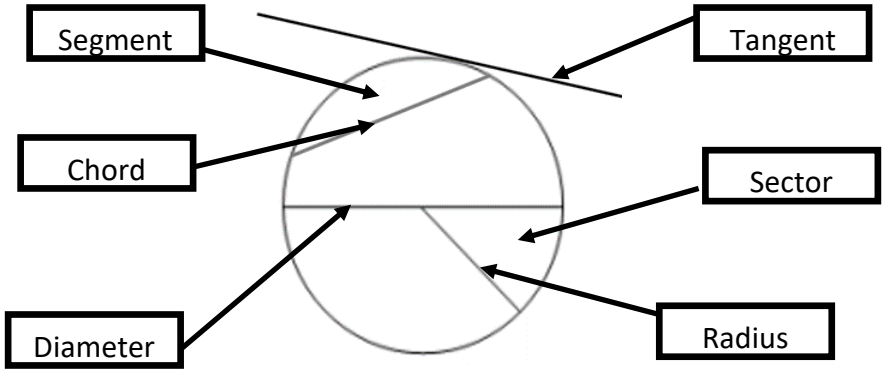
1 cm	**10 mm**
1 m	**100 cm**
1 km	**1000 m**

Units of weight

1 g	**1000 mg**
1 kg	**1000 g**
1 tonne	**1000 kg**

Units of capacity

1 litre	**1000 ml**
1 litre	**1000 cm^3**



Index Laws

$$a^n \times a^m = a^{n+m}$$
$$a^n \div a^m = a^{n-m}$$
$$(a^n)^m = a^{nm}$$
$$a^0 = 1$$
$$a^{-n} = \frac{1}{a^n}$$
$$a^{\frac{1}{m}} = \sqrt[m]{a}$$

Sides	Name
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon
10	Decagon
11	Hendecagon
12	Dodecagon

Polygons

Exterior angles of any polygon sum to 360^o

Sum of interior angles of polygon : 180 x (n—2)

Reciprocals

Reciprocal of 7 is $\frac{1}{7}$, reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$ etc

Percentages

Finding percentage increase or decrease (profit/loss)

$$\frac{value\ of\ increase/decrease}{Original} \times 100$$

Measures of Average

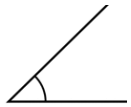
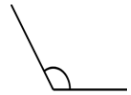
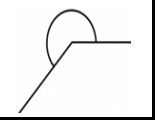
Mode: most common piece of data

Mean: Sum of the data ÷ total frequency

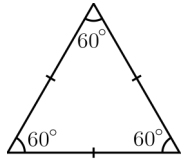
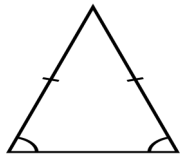
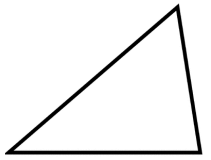
Median: order the data and find the middle value

Range: Highest value – lowest value

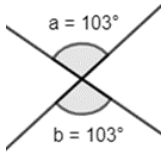
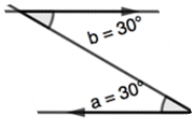
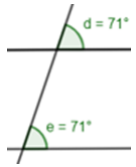
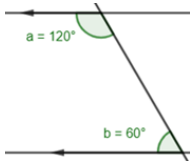
Types of angle

Acute angle	
Right angle	
Obtuse angle	
Reflex angle	

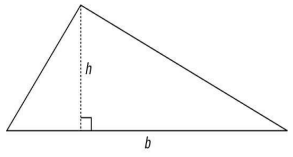
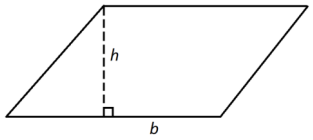
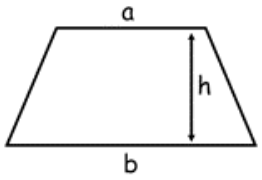
Types of Triangle

Equilateral	
Isosceles	
Scalene	

Angles in parallel lines

	Vertically opposite angles are equal.
	Alternate angles are equal.
	Corresponding angles are equal
	Co-Interior angles add up to 180^o

Area Formulae

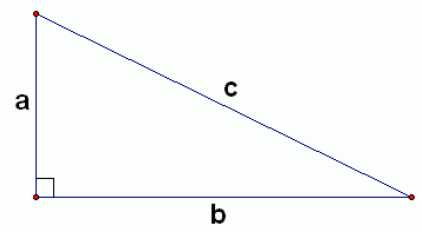
	Area of triangle $\frac{b \times h}{2}$
	Area of parallelogram $b \times h$
	**Area of a trapezium** $A = \frac{a+b}{2} \times h$

Circle Formulae

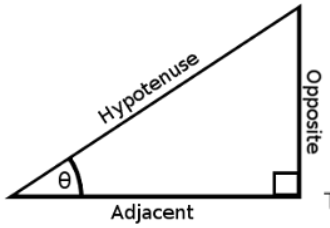
Area of a circle	$A = \pi \times r^2$
Circumference of a Circle	$C = \pi \times d$

Pythagoras

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



Right Angled Trigonometry

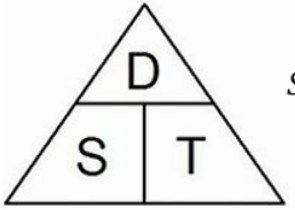


$\text{Sine} = \frac{opposite}{hypotenuse}$ $s = \frac{o}{h}$

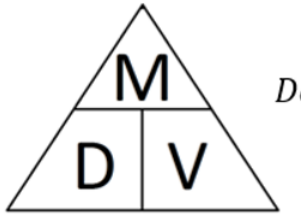
$\text{Cosine} = \frac{adjacent}{hypotenuse}$ $c = \frac{a}{h}$

$\text{Tangent} = \frac{opposite}{adjacent}$ $t = \frac{o}{a}$

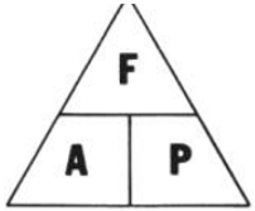
Compound Measures



$Speed = \frac{Distance}{Time}$



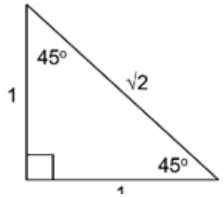
$Density = \frac{Mass}{Volume}$

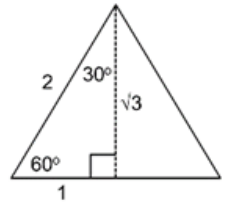


$Area = \frac{Force}{Pressure}$

Exact Trig Values

Angle (θ)	sin(θ)	cos(θ)	tan(θ)
0°	0	1	0
30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$
45°	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1
60°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
90°	1	0	undefined





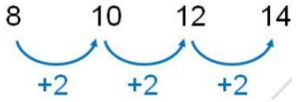
Algebraic Terms

Expression	no equal signs e.g. $2x + 3$, $2y$, $(3x - 2)^2$
Equation	An equal signs, one unknown, e.g. $y + 4 = 10$
Identity	Identical expressions e.g. $2(y + 4) \equiv 2y + 8$
Formula	equal signs, more than one unknown e.g. A= ½bh

Sequences

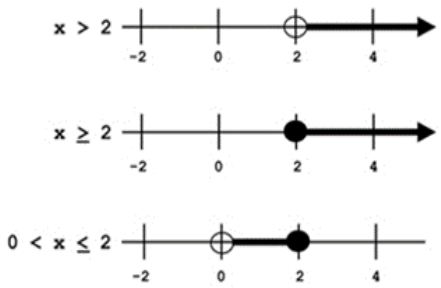
Nth term of a linear sequence : ***a***n + ***b***
Where
a is the term-to-term rule and
b is the 0th term (the number that would come before the 1st term)

E.g. Nth term: **2**n + **6**



Fibonacci Sequence:
a sequence where each term is the sum of the two previous terms
1, 1, 2, 3, 5, 8, 13, 21, 34 ...

Inequalities



Open circle: < / >

Closed circle: ≤ / ≥

Straight Line graphs

y = *m*x + *c*
Where *m* is the gradient and
c is the y-intercept

positive gradient

negative gradient

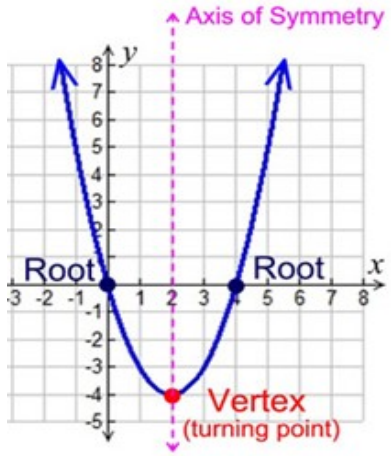
Gradient formula

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{change\ in\ y}{change\ in\ x}$$

Parallel Lines have equal gradients

Quadratic Graphs

Roots of a quadratic graph: where the graph crosses the x axis



Type of graphs