Yearly Assessment Notes

Properties of Geometrical Figures

Quadrilaterals

Classifying Triangles

CONVEX

- All angles less than 180 degrees
- All vertices pout OUTward
  CONCAVE
- One internal reflect angle
- One vertex points INward

Exterior Angle of a Triangle

- The <u>exterior angle</u> of a triangle is equal to the sum of the two <u>opposite interior</u> angles.
- For any triangle, the sum of two sides must be greater than the remaining side.

Classifying Triangles

Equilateral Triangle: All sides and angles equal. (All angles are 60 degrees) All sides of the same length.

Isoceles Triangle: Two sides and angles equal. Two sides of the same length.

Scalene Triangles: No sides or angles equal. All sides of different lengths.

Right Angled Triangles: They have one 90 degree angle.

Obtuse Triangle: Any triangle that has an angle greater than 90 degrees. (The other two are acute)

Acute Triangles: Abt triangles that has three acute angles.

Volume

Volume Formula

$$V = Ah$$

Where V is the volume of the object
A is the cross sectional area of the object
h is the height of the object

Cross Sections

A cross section of a prism is where however many times you cut it, the 2-dimensional shape stays the same.

Various Cross Section Formulas for other solids (multiply everything by the height (h) of the object)

Cube: $A = l^2$

Rectangular Prism: $A = bh$

Rhombic Prism: $A = \frac{1}{2}xy$

Trapezoidal Prism: $A = \frac{1}{2}(a+b)h$

Triangular Prism: $A = \frac{1}{2}bh$

Cylinder: $A = \pi r^2$

Semi-Cylinder?: $A = \frac{1}{2}\pi r^2$

Sector: $A = \frac{\theta}{360}\pi r^2$

Composite Solids

Split the solid into various recognizable solids, and then add them together

Difference between Capacity and Volume

Volume is the amount of space an object occupies whereas **capacity** is the amount of a fluid that an object can hold.

Units and Conversions of Capacity and Volume

Capacity – mL, L, kL etc.

Volume – mm^3, cm^3, m^3 etc.

$1cm^3$ is 1mL

$1m^3$ is 1 kL ($1000000cm^3$ is 1kL)

Linear Relationships

Using Graphs to Solve Linear Equations

- We know that each point on the line is a solution to the equation
- To solve a linear equation we can determine the x-value that corresponds to the required y-value on the line.

Using Graphs to Solve Inequalities

- A horizontal line (parallel to the x-axis) has the rule in the form of $y = c$ where c is any number
- A vertical line (parallel to the y-axis) has the rule in the form of $x = k$ where k is any number
- A region in the plane is described using an inequality.
    - All the points that satisfy the inequality form the shaded region

- A dashed line is used to show that the points on a line are not included in the region. A dashed line is used when the < and > symbols are given.
- A full line is used to show that the points on a line are included in the region. A full line is used when the $\leq$ and $\geq$ symbols are given.

$$y = mx + c$$

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y is the y value
m is the slope/gradient, also called the coefficient of x
x is the x value
c is the y intercept (where y crosses the x axis when $x = 0$)

Ways to solve a linear equation

1. Using table of value

Draw up a table of values with x being –2, –1, 0, 1, 2 (or whatever is suitable)
eg. $y = 2x + 1$

y	–2	–1	0	1	2
x	–3	–1	1	3	5

Plot the points, join the line and add arrows and label the line.

2. Using $y = mx + c$

c is the y-intercept so, plot (0, c)

m is the gradient of the line, so convert it to a fraction, so if m is a whole number, then make it $\frac{m}{1}$ and if it is fractional, keep it the same.
This fractional form is basically $\frac{rise}{run}$ so rise is how much the line is going up for every 1 x. So, from your y-intercept, count $rise$ number of units up and run number of units across.

Join the line and add arrows and label the line.

Angles

Supplementary and Complimentary Angles

- Supplementary Angles are angles that add up to 180 degrees.
- Complimentary Angles are angles that add up to 90 degrees.

Types of Angles

- Co-interior – They form a 'c' shape, and are supplementary.

- Corresponding – They make a 'f' shape and are equal.
- Alternate – They make a 'z' shape and are equal.