

Y11 Unit 2 Overview-Algebra and Shape:

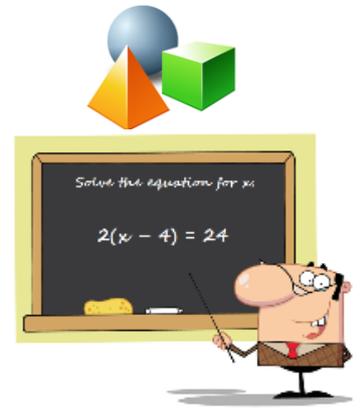
Target grade for tests:

You will learn about:

- Algebraic equations
- Similar shapes
- Maps, scale drawings and bearings
- Area and perimeter of shapes including circles
- Volume of right prisms

You will be able to:

- Solve linear equations with the unknown on both sides of the equation.
- Find approximate solutions to linear equations using a graph.
- Measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings.
- Identify, describe and construct similar shapes, including on coordinate axes, by considering enlargement.
- Interpret plans and elevations of 3D shapes.
- Use scale factors, scale diagrams and maps.
- Identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference.
- Know the formulae: circumference of a circle = $2\pi r = \pi d$, area of a circle = πr^2 .
- Calculate perimeters and areas of circles and composite shapes.
- Know and apply formulae to calculate volume of right prisms (including cylinders).



Lesson Overview

SOLVING EQUATIONS

- Identify the correct order of undoing the operations in an equation
- Solve linear equations with the unknown on one side when the solution is a negative number
- Solve linear equations with the unknown on both sides when the solution is a whole number, negative number or fraction
- Solve linear equations with the unknown on both sides when the equation involves brackets
- Recognise that the point of intersection of two graphs corresponds to the solution of a connected equation
- Check the solution to an equation by substitution

INVESTIGATING ANGLES

- Identify alternate angles and know that they are equal
- Identify corresponding angles and know that they are equal
- Use knowledge of alternate and corresponding angles to calculate missing angles in geometrical diagrams
- Establish the fact that angles in a triangle must total 180°
- Use the fact that angles in a triangle total 180° to work out the total of the angles in any polygon
- Establish the size of an interior angle in a regular polygon
- Know the total of the exterior angles in any polygon
- Establish the size of an exterior angle in a regular polygon

VISUALISING AND CONSTRUCTING

- Know the vocabulary of enlargement
- Find the centre of enlargement
- Find the scale factor of an enlargement
- Use the centre and scale factor to carry out an enlargement with positive integer (fractional) scale factor
- Know and understand the vocabulary of plans and elevations
- Interpret plans and elevations

Key Words

Refer to

<http://studymaths.co.uk/glossary.php>
for definitions of the key words

Algebra, algebraic, algebraically

Unknown

Equation

Operation

Solve

Solution

Brackets

Symbol

Substitute

Graph

Point of intersection

Notation

The lower case and upper case of a letter should not be swapped when worked with algebra

2a is used rather than a2.

Division is written as a fraction

Degrees

Right angle, acute angle, obtuse angle, reflex angle

Vertically opposite

Geometry, geometrical

Parallel

Alternate angles, corresponding angles

Interior angle, exterior angle

Regular polygon

Notation

Dash notation to represent equal lengths in shapes and geometric diagrams

Arrow notation to show parallel lines

Similar, Similarity

Enlarge, enlargement

- Use the concept of scaling in diagrams
- Measure and state a specified bearing
- Construct a scale diagram involving bearings
- Use bearings to solve geometrical problems

CALCULATING SPACE (AREA, PERIMETER AND VOLUME)

- Know the vocabulary of circles
- Know that the number π (pi) = 3.1415926535...
- Recall π to two decimal places
- Know the formula circumference of a circle = $2\pi r = \pi d$
- Calculate the circumference of a circle when radius (diameter) is given
- Calculate the radius (diameter) of a circle when the circumference is known
- Calculate the perimeter of composite shapes that include sections of a circle
- Know the formula area of a circle = πr^2
- Calculate the area of a circle when radius (diameter) is given
- Calculate the radius (diameter) of a circle when the area is known
- Calculate the area of composite shapes that include sections of a circle
- Know the formula for finding the volume of a right prism (cylinder)
- Calculate the volume of a right prism (cylinder)

Scaling
 Scale factor
 Centre of enlargement
 Object
 Image
 Scale drawing
 Bearing
 Plan, Elevation
Notation
 Bearings are always given as three figures;
 e.g. 025°.
 Coordinates must have a comma & brackets
 Circle
 Centre
 Radius, diameter, chord, circumference
 Pi
 (Right) prism
 Cross-section
 Cylinder
 Polygon, polygonal
 Solid
Notation
 π
 Abbreviations of units in the metric system:
 km, m, cm, mm, mm², cm², m², km², mm³,
 cm³, km³

Research	Note-making	Group work & discussion	Memorisation	Precision & accuracy	Independence	Reflection