

Y10 Unit 2 Overview-**Algebra and Shape**:

Test Date: WB 20th January, 2020.

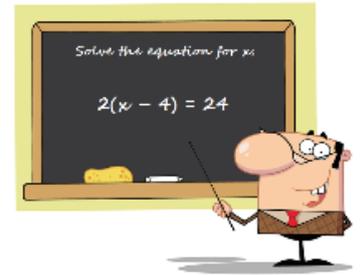
Target grade for tests:

You will learn about:

- Algebraic inequalities
- Construction
- Circles
- Pythagoras' theorem

You will be able to:

- Understand and use the concepts and vocabulary of inequalities and solve inequalities.
- Represent the solution set to an inequality on a number line.
- Use a ruler and compasses to construct: perpendicular bisector of a line segment, perpendicular to a given line from/at a given point, angle bisector and use these to solve loci problems.
- Construct plans and elevations of 3D shapes.
- Identify and apply circle definitions and properties, including: tangent, arc, sector and segment.
- Calculate arc lengths, angles and areas of sectors of circles.
- Calculate surface area of right prisms (including cylinders).
- Calculate exactly with multiples of π .
- Use Pythagoras' theorem.



Lesson Overview

SOLVING EQUATIONS AND INEQUALITIES

- Understand the meaning of the four inequality symbols
- Choose the correct inequality symbol for a particular situation
- Represent practical situations as inequalities
- Recognise a simple linear inequality
- Find the set of integers that are solutions to an inequality
- Use set notation to list a set of integers
- Use a formal method to solve an inequality
- Use a formal method to solve an inequality with unknowns on both sides
- Use a formal method to solve an inequality involving brackets
- Know how to deal with negative number terms in an inequality
- Know how to show a range of values that solve an inequality on a no. line
- Know when to use an open circle or filled circle at the end of a range of values shown on a number line
- Use a number line to find the set of values that are true for 2 inequalities

VISUALISING AND CONSTRUCTING

- Use compasses to construct clean arcs
- Use ruler and compasses to construct the perpendicular bisector of a line segment
- Use ruler and compasses to bisect an angle
- Use a ruler and compasses to construct a perpendicular to a line from a point (at a point)
- Understand the meaning of locus (loci)
- Know how to construct the locus of points a fixed distance from a point (from a line)
- Identify when to use the locus of points a fixed distance from a point (from a line)
- Identify when a perpendicular bisector is needed to solve a loci problem
- Identify when an angle bisector is needed to solve a loci problem
- Choose techniques to construct 2D shapes; e.g. rhombus

Key Words

Refer to

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

(Linear) inequality
Unknown
Manipulate
Solve
Solution set
Integer

Notation

The inequality symbols: < (less than), > (greater than), \leq (less than or equal to), \geq (more than or equal to)

The number line to represent solutions to inequalities. An open circle represents a boundary that is not included. A filled circle represents a boundary that is included.

Set notation; e.g. $\{-2, -1, 0, 1, 2, 3, 4\}$

Compasses
Arc
Line segment
Perpendicular
Bisect
Perpendicular bisector
Locus, Loci
Plan
Elevation

- Combine techniques to solve more complex loci problems
- Know how to deal with a change in depth when dealing with plans and elevations
- Construct a shape from its plans and elevations
- Construct the plan and elevations of a given shape

CALCULATING SPACE

- Know the vocabulary of circles
- Know how to find arc length
- Calculate the arc length of a sector when radius is given
- Know how to find the area of a sector
- Calculate the area of a sector when radius is given
- Calculate the angle of a sector when the arc length and radius are known
- Know how to find the surface area of a right prism (cylinder)
- Calculate the surface area of a right prism (cylinder)
- Calculate exactly with multiples of π
- Know Pythagoras' theorem
- Identify the hypotenuse in a right-angled triangle
- Know when to apply Pythagoras' theorem
- Calculate the hypotenuse of a right-angled triangle using Pythagoras' theorem
- Calculate one of the shorter sides in a right-angled triangle using Pythagoras' theorem

Notation

Bearings are always given as three figures; e.g. 025° .
Coordinates: separated by a comma and enclosed by brackets

Circle, Pi
Radius, diameter, chord, circumference, arc, tangent, sector, segment
(Right) prism, cylinder
Cross-section
Hypotenuse
Pythagoras' theorem

Notation

π
Abbreviations of units in the metric system: km, m, cm, mm, mm^2 , cm^2 , m^2 , km^2 , mm^3 , cm^3 , km^3

Suggested reading or support/ challenge available

Support is available from a Maths teacher in 'MORALE' in M1 daily from 1:30pm -1:45pm

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Cross curricular

SMSC:
1.1 Exploring, understanding and respecting cultural diversity e.g. exploration of different methods of calculation.
3.1 Developing personal qualities and using social skills (regular paired/ group work communication).
3.2 Participating, cooperating and resolving conflicts (paired/group activities).
4.2 Experiencing fascination, awe and wonder of mathematics.
4.4 Using imagination and creativity in learning.
Literacy:
Verbal communication of understanding using key words in the correct context. Development of written communication of methods and strategies to problem solve.
NAC:
Science – Use formulae involving fractions, decimals or negative numbers (Y10, 11). Transform formulae. Be aware of common scientific formulae. Use simple formulae. Understand angle as a measure of turn. Measure and draw angles. Recognise 2-D representations of 3-D shapes. Make simple 3-D models from nets. Know and use the formula for the area of a rectangle. Calculate areas of sectors. Calculate lengths and areas in plane shapes. Use the formulae for the volume of a cuboid. Determine the locus of a moving object.
Business – Use formulae involving fractions, decimals or negative numbers (Y10, 11). Use simple formulae (Y11).
Technology- Make simple 3-D models from nets.

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

