

## 4 Geometry

### 4.1 Geometrical terms

### Notes and examples

1 Use and interpret the following geometrical terms:

- point
- vertex
- line
- plane
- parallel
- perpendicular
- perpendicular bisector
- bearing
- right angle
- acute, obtuse and reflex angles
- interior and exterior angles
- similar
- congruent
- scale factor.

Candidates are **not** expected to show that two shapes are congruent.

2 Use and interpret the vocabulary of:

- triangles
- special quadrilaterals
- polygons
- nets
- solids.

Includes the following terms.

Triangles:

- equilateral
- isosceles
- scalene
- right-angled.

Quadrilaterals:

- square
- rectangle
- kite
- rhombus
- parallelogram
- trapezium.

*continued*

## 4 Geometry (continued)

### 4.1 Geometrical terms (continued)

#### Notes and examples

Polygons:

- regular and irregular polygons
- pentagon
- hexagon
- octagon
- decagon.

Solids:

- cube
- cuboid
- prism
- cylinder
- pyramid
- cone
- sphere
- hemisphere
- frustum
- face
- surface
- edge.

3 Use and interpret the vocabulary of a circle.

Includes the following terms:

- centre
- radius (plural radii)
- diameter
- circumference
- semicircle
- chord
- tangent
- major and minor arc
- sector
- segment.

## 4 Geometry (continued)

### 4.2 Geometrical constructions

#### Notes and examples

- 1 Measure and draw lines and angles.
- 2 Construct a triangle, given the lengths of all sides, using a ruler and pair of compasses only.
- 3 Draw, use and interpret nets.

A ruler should be used for all straight edges. Constructions of perpendicular bisectors and angle bisectors are **not** required.

e.g. construct a rhombus by drawing two triangles. Construction arcs must be shown.

Examples include:

- draw nets of cubes, cuboids, prisms and pyramids
- use measurements from nets to calculate volumes and surface areas.

### 4.3 Scale drawings

#### Notes and examples

- 1 Draw and interpret scale drawings.
- 2 Use and interpret three-figure bearings.

A ruler must be used for all straight edges.

Bearings are measured clockwise from north ( $000^\circ$  to  $360^\circ$ ), e.g. Find the bearing of  $A$  from  $B$  if the bearing of  $B$  from  $A$  is  $025^\circ$ .

Includes an understanding of the terms north, east, south and west, e.g. point  $D$  is due east of point  $C$ .

### 4.4 Similarity

#### Notes and examples

- 1 Calculate lengths of similar shapes.
- 2 Use the relationships between lengths and areas of similar shapes and lengths, surface areas and volumes of similar solids.
- 3 Solve problems and give simple explanations involving similarity.

Includes use of scale factor, e.g.

$$\frac{\text{Volume of } A}{\text{Volume of } B} = \frac{(\text{Length of } A)^3}{(\text{Length of } B)^3}$$

Includes showing that two triangles are similar using geometric reasons.

### 4.5 Symmetry

#### Notes and examples

- 1 Recognise line symmetry and order of rotational symmetry in two dimensions.
- 2 Recognise symmetry properties of prisms, cylinders, pyramids and cones.

Includes properties of triangles, quadrilaterals and polygons directly related to their symmetries.

e.g. identify planes and axes of symmetry.

## 4 Geometry (continued)

### 4.6 Angles

#### Notes and examples

- 1 Calculate unknown angles and give simple explanations using the following geometrical properties:
  - sum of angles at a point =  $360^\circ$
  - sum of angles at a point on a straight line =  $180^\circ$
  - vertically opposite angles are equal
  - angle sum of a triangle =  $180^\circ$  and angle sum of a quadrilateral =  $360^\circ$ .
- 2 Calculate unknown angles and give geometric explanations for angles formed within parallel lines:
  - corresponding angles are equal
  - alternate angles are equal
  - co-interior angles sum to  $180^\circ$  (supplementary).
- 3 Know and use angle properties of regular and irregular polygons.

Knowledge of three-letter notation for angles is required, e.g. angle  $ABC$ . Candidates are expected to use the correct geometrical terminology when giving reasons for answers.

Includes exterior and interior angles, and angle sum.

### 4.7 Circle theorems I

#### Notes and examples

- Calculate unknown angles and give explanations using the following geometrical properties of circles:
- angle in a semicircle =  $90^\circ$
  - angle between tangent and radius =  $90^\circ$
  - angle at the centre is twice the angle at the circumference
  - angles in the same segment are equal
  - opposite angles of a cyclic quadrilateral sum to  $180^\circ$  (supplementary)
  - alternate segment theorem.

Candidates are expected to use the geometrical properties listed in the syllabus when giving reasons for answers.

### 4.8 Circle theorems II

#### Notes and examples

- Use the following symmetry properties of circles:
- equal chords are equidistant from the centre
  - the perpendicular bisector of a chord passes through the centre
  - tangents from an external point are equal in length.

Candidates will be expected to use the geometrical properties listed in the syllabus when giving reasons for answers.