

**CHAPTER 4: POLYGONS AND SOLIDS**

4A

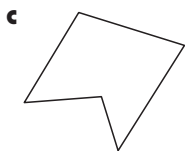
**POLYGONS**

**REMINDER**

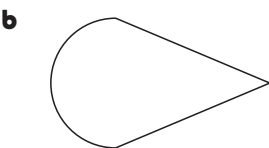
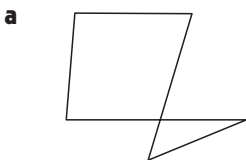
A **polygon** is a closed figure which has only straight line sides and which does not cross itself.

Number of sides	Polygon name
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon
10	Decagon
12	Dodecagon

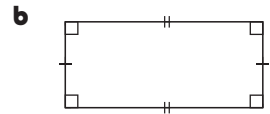
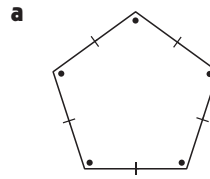
1 Name these polygons according to their number of sides:



2 Explain why these shapes are *not* polygons:

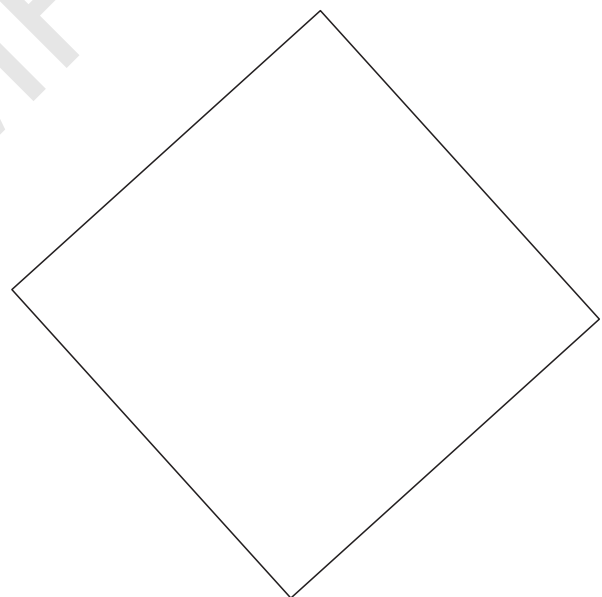


3 Which of the following are regular polygons?



4 Draw a pentagon with equal sides but with unequal angles.

5 Use a ruler and protractor to determine whether the following polygon is regular.



4B

**TRIANGLES**

**REMINDER**

A **triangle** is a polygon with three sides.

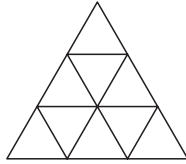
A triangle is:

- **scalene** if the three sides all have different lengths
- **isosceles** if at least two sides have the same length
- **equilateral** if all three sides have the same length.

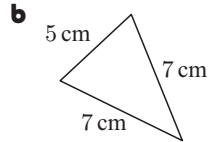
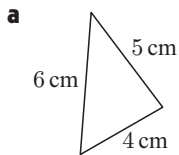
**REMINDER**

A **regular polygon** is a polygon with all sides the same length and all angles the same size.

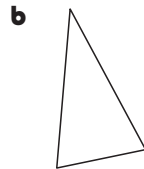
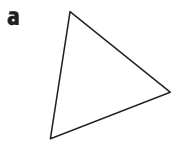
- 1 How many triangles are in the given figure?



- 2 Classify the following triangles:



- 3 Use a ruler to measure each side of these triangles. Hence classify each triangle.

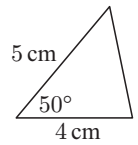


- 4 Accurately construct a triangle with sides 5 cm, 6 cm, and 3 cm.

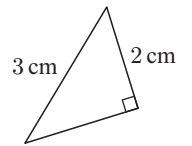
- 5 Try to construct a triangle with sides 5 cm, 2 cm, and 3 cm.

Is it possible to construct this triangle? Explain your answer.

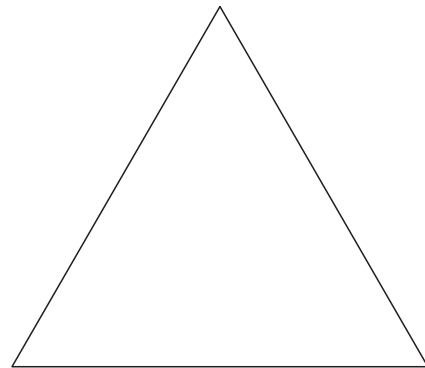
- 6 Use a protractor and ruler to accurately construct this triangle:



- 7 Use a compass, protractor, and ruler to accurately construct this triangle:



- 8



- a Measure the sides of the triangle given.
- b Measure the angles of the triangle.
- c What do you suspect about the angles of an equilateral triangle?

4C

QUADRILATERALS

REMINDER

A quadrilateral is a polygon with four sides.

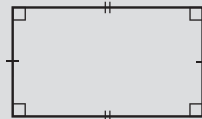
- A **parallelogram** has both pairs of opposite sides parallel.

The opposite sides of a parallelogram are equal in length.

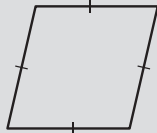


- A **rectangle** is a parallelogram with right angled corners.

The opposite sides of a rectangle are equal in length.

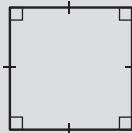


- A **rhombus** is a parallelogram with all four sides equal in length.



- A **square** is a rectangle with all sides equal in length.

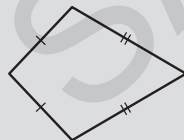
Both pairs of opposite sides of a square are parallel.



- A **trapezium** has one pair of opposite sides which are parallel.

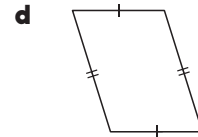
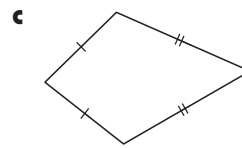
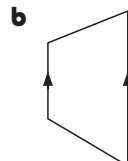
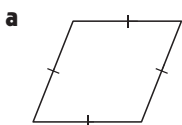


- A **kite** has two pairs of adjacent sides which are equal in length.



- Draw an example of a:
  - square
  - parallelogram.

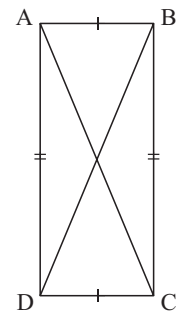
- Name the following quadrilaterals:



- Show how two triangles can be combined to form a:
  - trapezium
  - parallelogram.

- True or false?
  - A square is a special type of rectangle.
  - A rectangle is a special type of kite.

- Measure the diagonals of the rectangle alongside.



- What do you notice?

4D

SOLIDS

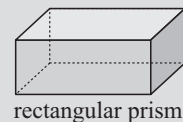
REMINDER

Solids are objects which occupy space.

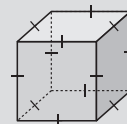
A **cross-section** of a solid is the shape of a slice through it.

- A **prism** is a solid with a uniform cross-section that is a polygon.

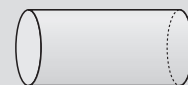
For example,



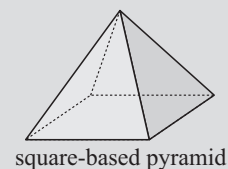
- A **cube** is a rectangular prism with sides all the same length.



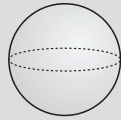
- A **cylinder** is a solid with a circular uniform cross-section.



- A **pyramid** is a solid with a polygon base. It has triangular faces which come from its base to meet at a point called the **vertex**.



- A **cone** is a solid with a circular base and a curved surface from the base to the vertex.
- A **sphere** is a ball-shaped solid.

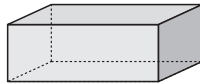


1 Name these solids:

a



b



2 Draw an example of a:

a triangular-based pyramid

b triangular prism.

3 Which solid would best describe the shape of:

a a block of cheese

b an orange?



4 State whether the following solids have:

**A** only flat surfaces      **B** only curved surfaces

**C** both flat and curved surfaces.

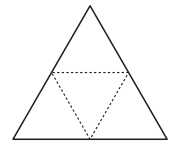
a cube

b cone

c pentagonal prism

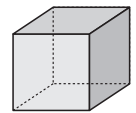
5 Name a solid which has only square surfaces.

1 Draw and name the solid which would be formed from this net.



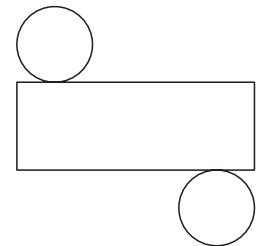
2 Draw a net for a square-based pyramid.

3 a Draw the net which could be used to construct this cube.



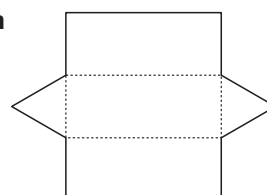
b How would you change this net so that the box is open at the top?

4 Identify the solid which would be formed from this net.

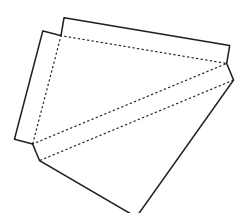


5 Determine whether these nets can be used to make a triangular prism:

a



b



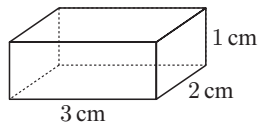
4E

CONSTRUCTING SOLIDS

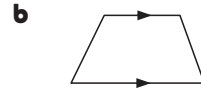
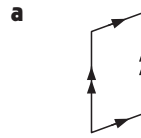
REMINDER

Nets are patterns which can be folded along certain lines so that we can make 3-dimensional models of solids.

- 6 Draw an *exact* net which could be used to construct:



- 5 Name these quadrilaterals:



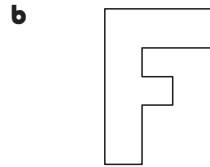
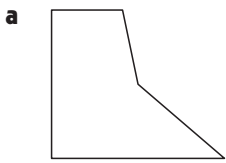
- 6 Draw an example of a:

a sphere

b pentagonal prism.

**REVIEW OF CHAPTER 4**

- 1 Name the following polygons according to their number of sides:

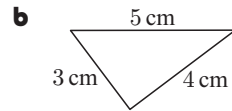
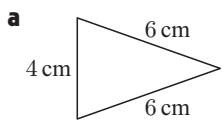


- 2 Draw the following polygons:

a equilateral triangle

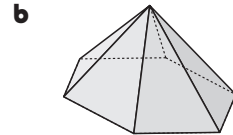
b regular pentagon

- 3 Classify the following triangles:



- 4 Using a compass and ruler only, construct a triangle with sides 4 cm, 2 cm, and 3 cm.

- 7 Name these solids:



- 8 Draw and name the solids which would be formed from the following nets:

