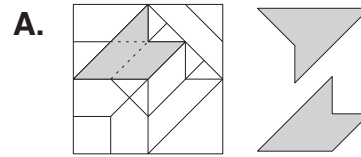
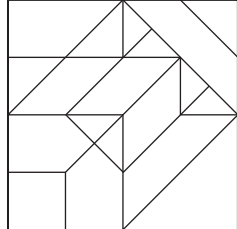
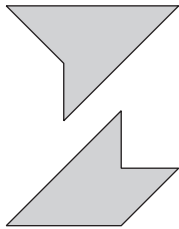


20. [Exploring Geometry]

Skill 20.1 Recognising 2D shapes.

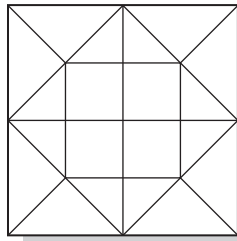
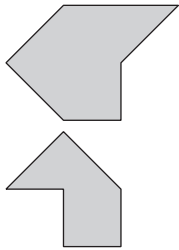
MM3.2 1 1 2 2 3 3 4 4
MM4.1 1 1 2 2 3 3 4 4

- Q.** One of these shapes is hidden in the maze. Find it and colour it in.
(Same size and orientation.)

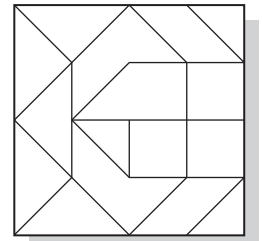
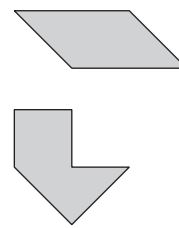


Trace and cut out the shapes to lay over the maze. Slide them to check possible positions. [Remember: Do not change their orientation by turning them. The shapes must have every edge outlined.]

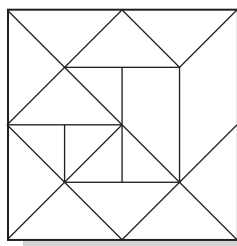
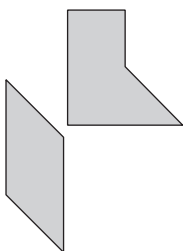
- a)** One of these shapes is hidden in the maze. Find it and colour it in.
(Same size and orientation.)



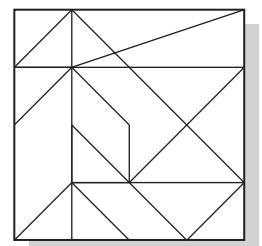
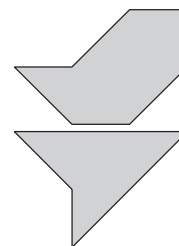
- b)** One of these shapes is hidden in the maze. Find it and colour it in.
(Same size and orientation.)



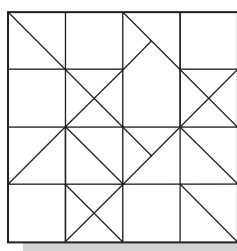
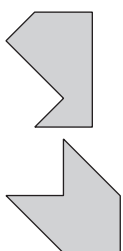
- c)** One of these shapes is hidden in the maze. Find it and colour it in.
(Same size and orientation.)



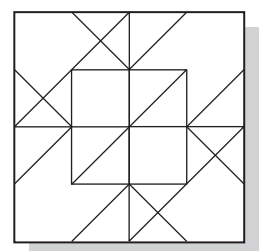
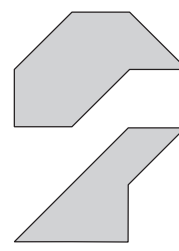
- d)** One of these shapes is hidden in the maze. Find it and colour it in.
(Same size and orientation.)



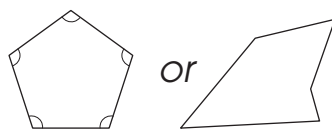
- e)** One of these shapes is hidden in the maze. Find it and colour it in.
(Same size and orientation.)



- f)** One of these shapes is hidden in the maze. Find it and colour it in.
(Same size and orientation.)



- Draw two dimensional shapes (2D) in two directions, length and width.
Hint: 2D shapes have no height.
- Use the name of the shape (based on Latin and Greek words) to work out the number of sides.

*Hint:**poly - many**equi - equal**gon - angle**lateral - side**mono - one**bi or di - two**tri - three**quad or tetra - four**penta - five**hexa - six**hepta - seven**octa - eight**nona - nine**deca - ten***Q.** Draw a pentagon.**A.**

Consider the name:

gon = angle

penta = 5

You need to draw a shape that has 5 interior angles and therefore 5 sides.

a) Draw a quadrilateral.**b)** Draw a triangle.**c)** Draw a rectangle.*quad = 4**lateral = sides***d)** Draw a square.**e)** Draw a decagon.**f)** Draw a heptagon.**g)** Draw a pentagon.**h)** Draw an octagon.**i)** Draw a nonagon.**j)** Draw a trapezium.**k)** Draw a hexagon.**l)** Draw an equilateral triangle.

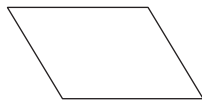
Skill 20.3 Describing polygons.

MM3.2 11 22 33 44
MM4.1 11 22 33 44

- Use the name of the polygon (poly means 'many' and gon means 'angle' to determine the number of interior angles or the number of sides.

Hint: The number of interior angles = The number of sides.

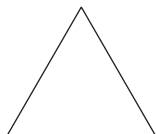
Q. How many sides does a rhombus have?



A. 4

A rectangle, square, trapezium and rhombus all belong to the quadrilateral family. quad = 4
lateral = sides

a) How many interior angles does a triangle have?

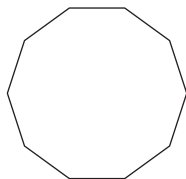


3

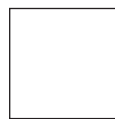
b) How many sides does a rectangle have?



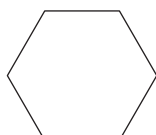
c) How many sides does a decagon have?



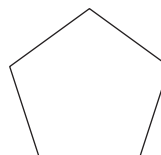
d) How many interior angles does a square have?



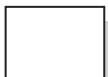
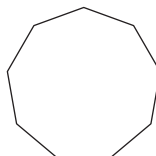
e) How many interior angles does a hexagon have?



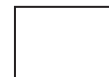
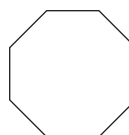
f) How many sides does a pentagon have?



g) How many sides does a nonagon have?



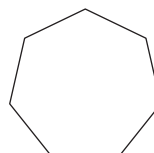
h) How many sides does an octagon have?



i) How many interior angles does a quadrilateral have?



j) How many sides does a heptagon have?



- Observe whether the 3D shape has a curved surface (cones, cylinders and spheres) or flat surfaces (pyramids and prisms).
- If all surfaces are flat, then decide if the figure is a pyramid (narrowing to a point) or a prism (rectangular lateral faces).

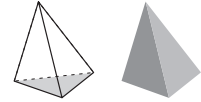
Q. What type of solid is shown below:

- A) triangular pyramid
- B) triangular prism
- C) cone

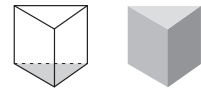


A. C

A) Triangular pyramid would have a triangle at its base and 3 faces that are triangular.
incorrect



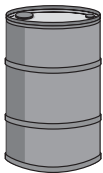
B) Triangular prism would have a triangle at its base and top, and 3 faces that are rectangular.
incorrect



C) Cone has a circular base and one curved surface narrowing to a point.
correct

a) What type of solid is shown below:

- A) cone
- B) sphere
- C) cylinder



C

b) What type of solid is shown below:

- A) square pyramid
- B) rectangular prism
- C) cone



c) What type of solid is shown below:

- A) square pyramid
- B) cube
- C) sphere



d) What type of solid is shown below:

- A) rectangular prism
- B) triangular prism
- C) cylinder



e) What type of solid is shown below:

- A) cylinder
- B) cone
- C) sphere

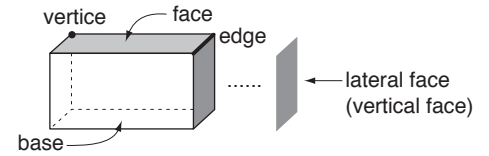


f) What type of solid is shown below:

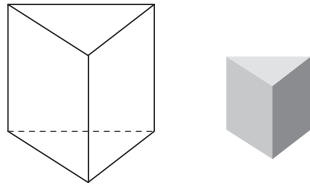
- A) rectangular prism
- B) square pyramid
- C) cube



- Count the number of: Faces, Edges and/or Vertices (points/corners).

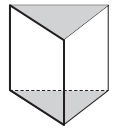


Q. What is the shape of the 3 lateral faces of the triangular prism?

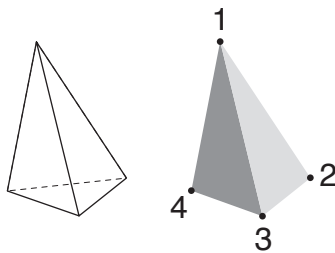


A. *rectangle*

The 2 parallel bases of a triangular prism are triangular in shape. These triangles, as for all prisms, are joined by rectangular faces. The number of rectangular faces is the same as the number of sides on the base shape.



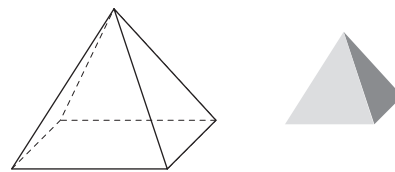
a) How many vertices does a triangular pyramid have?



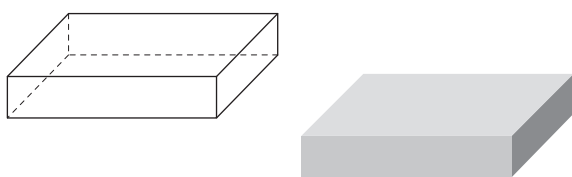
Count the number of points.

4

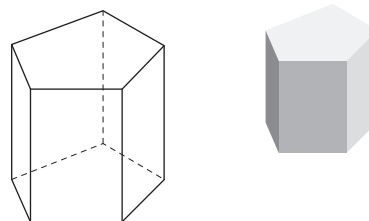
b) How many edges does a rectangular pyramid have?



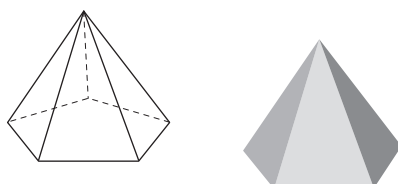
c) How many edges does a rectangular prism have?



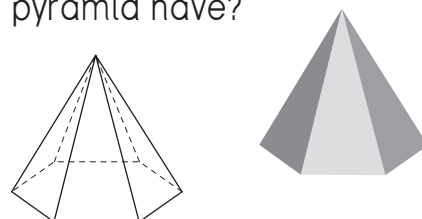
d) What is the shape of the 5 lateral (vertical) faces of the pentagonal prism?



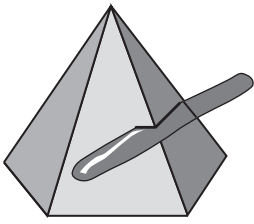
e) How many vertices does a pentagonal pyramid have?



f) How many faces does a hexagonal pyramid have?



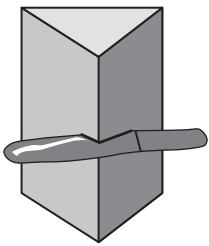
Q. Name the shape of the cross-section through the pentagonal pyramid.



A. **pentagon**

The base of the pyramid is a pentagon. The shape of the cross-section will also be pentagonal.

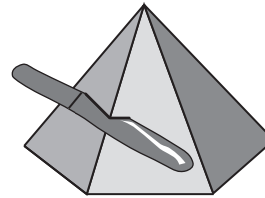
a) Name the shape of the cross-section through the triangular prism.



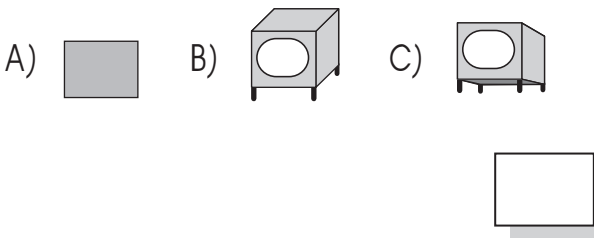
The view of the cross-section is the same as the view from the top.

triangle

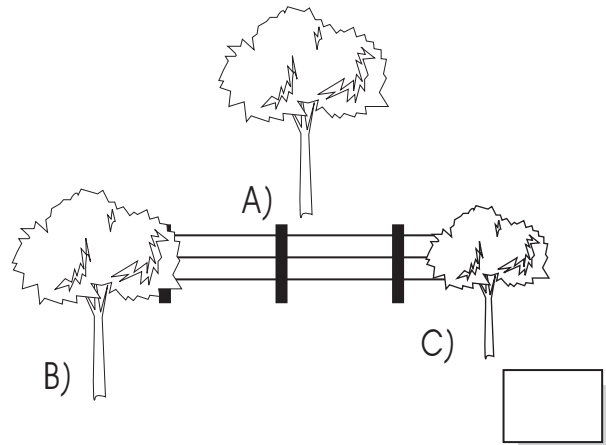
b) Name the shape of the cross-section through the hexagonal pyramid.



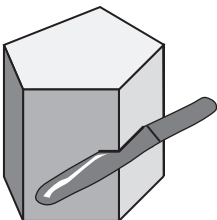
c) A fly on the ceiling, a father and a baby all looked at the television. Which view looks like the one seen by the fly?



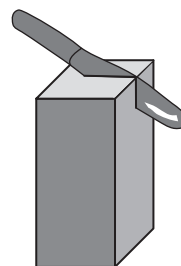
d) In the sketch below, which tree is the biggest?



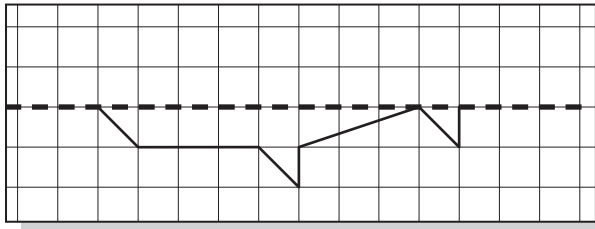
e) Name the shape of the cross-section through the pentagonal prism.



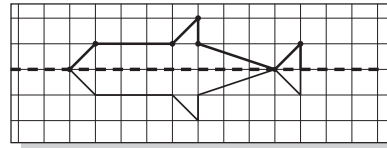
f) Name the shape of the cross-section through the square prism.



- Q.** The dashed horizontal line is an axis of symmetry. Complete the drawing so that it is symmetrical about this axis of symmetry.



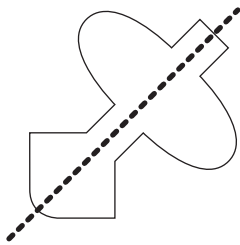
A.



Hold a mirror vertically on the axis. What you see is what needs to be drawn behind.

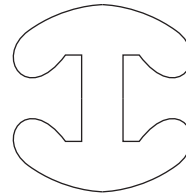
OR Mark every turning point on the shape. Copy these points to the same distance above the axis of symmetry as they are below. Join the points.

- a)** Draw the line of symmetry through the shape.

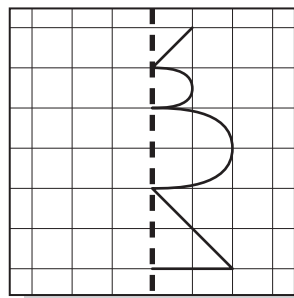


The shape on one side of the line is identical to the shape on the other side of the line. The line of symmetry is oblique.

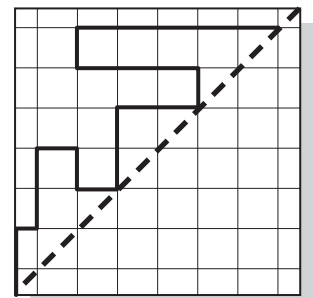
- b)** Draw the two lines of symmetry through the shape.



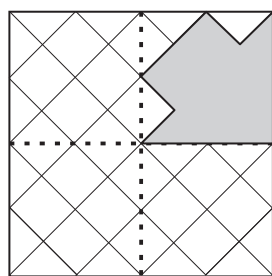
- c)** The dashed vertical line is an axis of symmetry. Complete the drawing so that it is symmetrical about this axis of symmetry.



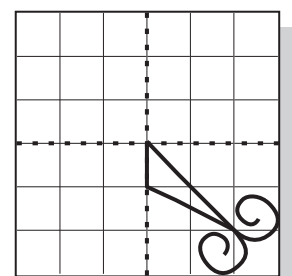
- d)** The dashed oblique line is an axis of symmetry. Complete the drawing so that it is symmetrical about this axis of symmetry.



- e)** This design has two lines of symmetry shown by the dotted lines. Complete the design.



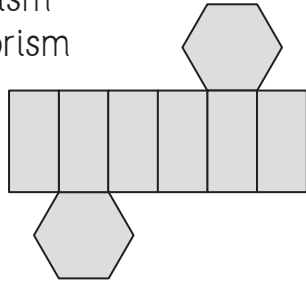
- f)** This design has two lines of symmetry shown by the dotted lines. Complete the design.



- Identify the shapes in the net.
- Imagine the shape folded. OR Make a model by tracing, cutting out and folding the net.

Q. Which shape can this net be used to make?

- A) hexagonal pyramid
- B) hexagonal prism
- C) rectangular prism



A. B

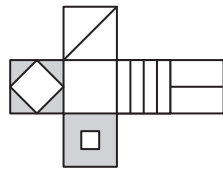
The net is formed from 2 hexagons and 6 rectangles. Pyramids have triangles as their lateral sides. Prisms have rectangles. It must be a prism not a pyramid. This prism has hexagons as its base and top.

OR

Trace, cut out and fold the shape.

a) Which of the boxes can be made from the net below?

- A)
- B)
- C)

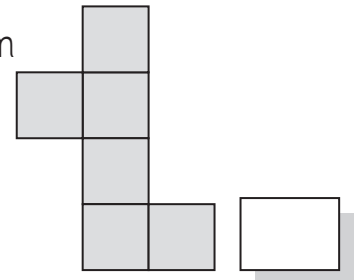


Trace, cut out and fold the shape.

B

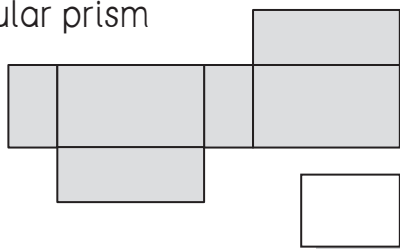
b) Which shape can this net be used to make?

- A) cube
- B) tetrahedron
- C) square prism



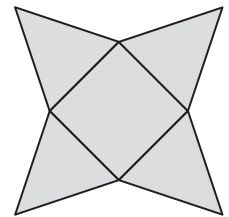
c) Which shape can this net be used to make?

- A) square prism
- B) rectangular prism
- C) cube



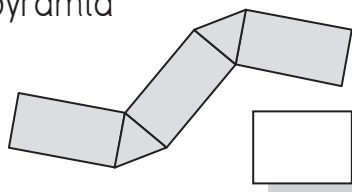
d) Which shape can this net be used to make?

- A) triangular pyramid
- B) square prism
- C) square pyramid



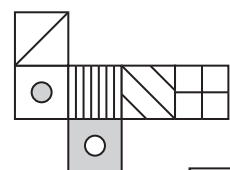
e) Which shape can this net be used to make?

- A) cube
- B) triangular prism
- C) triangular pyramid



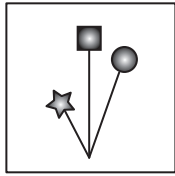
f) Which of the boxes can be made from the net below?

- A)
- B)
- C)

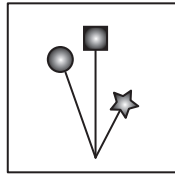


Q. Which movement has transformed this shape?

- A) flip (reflection)
- B) slide (translation)
- C) turn (rotation)



Position 1



Position 2

A. A

A) Hold a mirror vertically on the right edge of position 1. This shows the object has been reflected to achieve position 2. correct

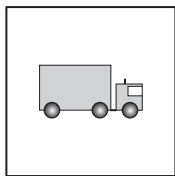
Sketch the object as in position 1.
B) Try flipping it. Note the change in position as a result. incorrect

C) Try sliding it. Note the change in position as a result. incorrect

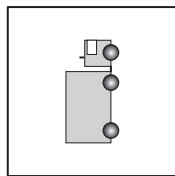
a) Which movement has transformed this shape?

- A) flip (reflection)
- B) slide (translation)
- C) turn (rotation)

The truck has been turned a quarter of a turn, anticlockwise.



Position 1

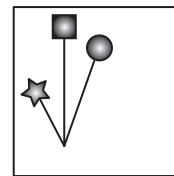


Position 2

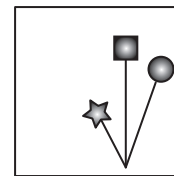
C

b) Which movement has transformed this shape?

- A) flip (reflection)
- B) slide (translation)
- C) turn (rotation)



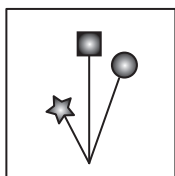
Position 1



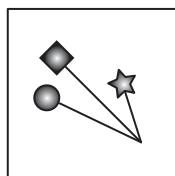
Position 2

c) Which movement has transformed this shape?

- A) flip (reflection)
- B) slide (translation)
- C) turn (rotation)



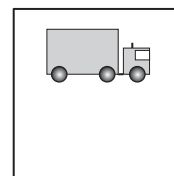
Position 1



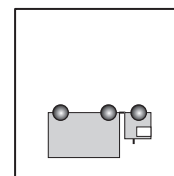
Position 2

d) Which movement has transformed this shape?

- A) flip (reflection)
- B) slide (translation)
- C) turn (rotation)



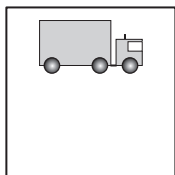
Position 1



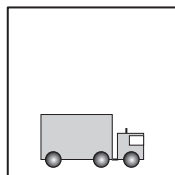
Position 2

e) Which movement has transformed this shape?

- A) flip (reflection)
- B) slide (translation)
- C) turn (rotation)



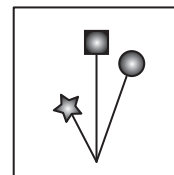
Position 1



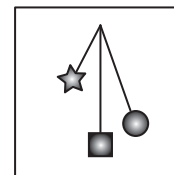
Position 2

f) Which movement has transformed this shape?

- A) flip (reflection)
- B) slide (translation)
- C) turn (rotation)



Position 1



Position 2