Shapes, plane & solid
Student Book - Series H

Contents

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Shapes, plane and solid

Topic 1 - Lines and angles

QUESTION **1** Draw the following.

a A point _____ **b** A straight line _____

c A ray _____ **d** An interval _____

e A curved line _____ **f** A vertical line _____

QUESTION **2** Draw the following.

a Parallel lines _____ **b** Perpendicular lines _____

c An acute angle _____ **d** A right angle _____

e An obtuse angle _____ **f** A straight angle _____

g A reflex angle _____ **h** A revolution _____

QUESTION **3** Draw the following.

a Vertically opposite angles _____ **b** Complementary angles _____

c Supplementary angles _____ **d** Alternate angles _____

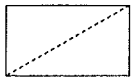
e Corresponding angles _____ **f** Co-interior angles _____

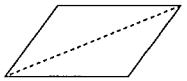
Shapes, plane and solid

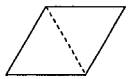
Topic 2 - Triangles, quadrilaterals and polygons

Question 1 Two identical shapes have been joined to form a polygon. In each of the following, name the polygon.

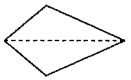
a 

b 

c 

d 

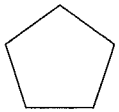
e 

f 

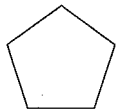
Question 2 Complete the following table.

	Number of sides	Name of shape		Number of sides	Name of shape
a	3		f	8	
b	4		g	9	
c	5		h	10	
d	6		i	11	
e	7		j	12	

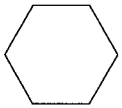
Question 3 Divide the following polygons into the shapes written below them.

a 

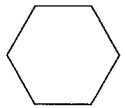
a triangle and a trapezium

b 

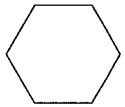
3 triangles

c 

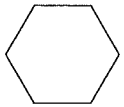
a rectangle and 2 triangles

d 

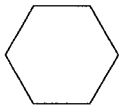
2 trapeziums

e 

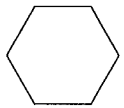
6 triangles

f 

4 triangles

g 

2 triangles and 2 rhombuses

h 

a quadrilateral and 2 triangles

Shapes, plane and solid

Topic 3 - Circles

Question 1 Name the following parts of the circle.

a 

b 

c 

d 

e 

f 

Question 2 Name the following.

a 

b 

c 

d 

e 

f 

Question 3 Name the following.

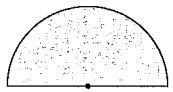
a 

b 

c 

Question 4 Find the fraction of the circle given.

a 

b 

c 

d 

Shapes, plane and solid

Topic 4 - Properties of angles and parallel lines

Question 1 Complete the following sentences.

a An acute angle is less than _____.

b A right angle is equal to _____.

c An obtuse angle is greater than _____ but less than _____.

d A straight angle is equal to _____.

e A reflex angle is greater than _____ but less than _____.

f A revolution is equal to _____.

Question 2 Complete the following statements.

a Vertically opposite angles are _____.

b Complementary angles add up to _____.

c Supplementary angles add up to _____.

d The angle sum of a triangle is equal to _____.

e The angle sum of a quadrilateral is equal to _____.

Question 3 Complete the following statements.

If two parallel lines are intersected by a transversal, ...

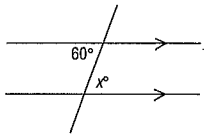
a the alternate angles are _____.

b the corresponding angles are _____.

c the co-interior angles are _____.

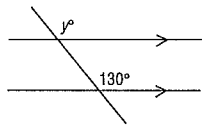
Question 4 Find the value of the pronumeral in each of the following.

a



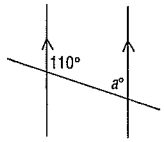
_____

b



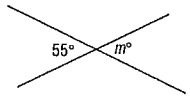
_____

c



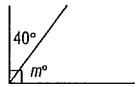
_____

d



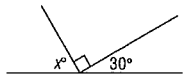
_____

e



_____

f



_____

Shapes, plane and solid

Topic 5 - Axis of symmetry and point symmetry

Question 1 How many axes of symmetry do the following shapes have?

a

_____

b

_____

c

_____

d

_____

e

_____

f

_____

g

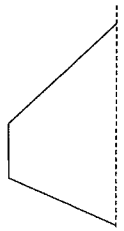
_____

h

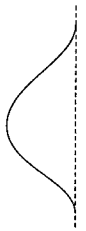
_____

Question 2 Complete the following half-pictures. The dotted line is the axis of symmetry.

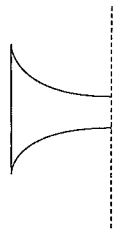
a



b



c



Question 3 Draw capital letters of the alphabet that have ...

a more than one axis of symmetry _____

b no axis of symmetry _____

Question 4 Which of the following shapes have point symmetry?

a

_____

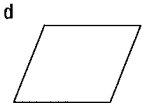
b

_____

c

_____

d



_____

e

_____

Shapes, plane and solid

Topic 6 - Types of triangles

QUESTION **1** Complete the following sentences.

a An equilateral triangle is a triangle in which _____ sides are equal.

b An isosceles triangle is a triangle in which _____ sides are equal.

c A scalene triangle is a triangle in which _____ sides are equal.

d An acute-angled triangle has _____ angles acute.

e An obtuse-angled triangle has _____ obtuse angle.

f An right-angled triangle has _____ right angle.

QUESTION **2** Complete the following statements.

a The interior angles of an equilateral triangle are _____.

b The base angles of an isosceles triangle are _____.

c The angle sum of a triangle is _____.

d A triangle has all angles of equal size. The size of each angle is _____.

e An exterior angle of a triangle is always equal to the sum of the _____ angles.

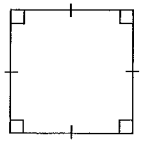
QUESTION **3** There are six members of the triangle family. Complete the following table.

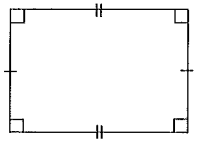
	Name of triangle	Diagram	Number of equal sides	Number of axes of symmetry	Angle sum
a	Equilateral				
b	Isosceles				
c	Scalene				
d	Acute-angled				
e	Right-angled				
f	Obtuse-angled				

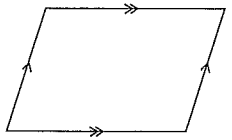
Shapes, plane and solid

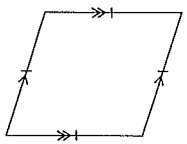
Topic 7 - Types of quadrilaterals

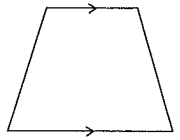
QUESTION **1** Name the folllowing quadrilaterals.

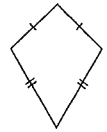
a 

b 

c 

d 

e 

f 

QUESTION **2** Complete the table by writing 'yes' or 'no' in the space provided.

	Properties	Square	Rectangle	Parallelogram	Rhombus	Trapezium	Kite
a	Opposite sides are equal						
b	Opposite sides are parallel						
c	Opposite angles are equal						
d	Each angle is 90°						
e	Angle sum is 360°						
f	Diagonals are equal						
g	Diagonals bisect each other						
h	Diagonals bisect each other at 90°						
i	All sides are equal						

Shapes, plane and solid

Topic 8 - Solids

QUESTION **1** Complete the following statements.

a Solids that have only square faces are _____.

b Solids that have rectangular faces are _____.

c Solids with some triangular faces are _____.

d Solids with circular faces are _____.

QUESTION **2**

a Name the solid. _____

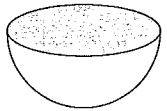
b How many surfaces does it have? _____

c How many flat surfaces does it have? _____

d How many curved surfaces does it have? _____

e How many vertices does it have? _____

f How many edges does it have? _____



QUESTION **3** Complete the following table.

	Name of solid	Diagram	Number of faces (f)	Number of vertices (v)	Number of edges (e)	$f + v - 2 = e$
a	Cube					
b	Rectangular prism					
c	Triangular prism					
d	Pentagonal prism					
e	Square pyramid					
f	Triangular pyramid					

Shapes, plane and solid

Topic 9 - Problem solving and shapes

1 Write true or false for the following.

a A rectangle is a solid. _____

b All triangles have three interior angles. _____

c Regular faces have equal sides and equal angles. _____

d All polygons have more than five sides. _____

e A cylinder has two edges. _____

f A prism and pyramid are the same. _____

2 Write the size of each angle of a rectangle.

_____

3 Write the size of each angle of an equilateral triangle.

_____

4 If the vertical angle of an isosceles triangle is 40°, find the size of each of its base angles.

_____

5 The angle sum of a quadrilateral is 360°. A parallelogram is a quadrilateral. If one of its angles is 80°, find the size of the other three angles.

_____

6 If two angles of a triangle add up to 130°, find the size of the third angle.

_____

7 Write the name of a solid that has all square faces.

_____

8 Write the name of a solid that does not have any edges.

_____

9 Are all parallelograms rhombuses?

_____

10 Are all rhombuses parallelograms?

_____

Shapes, plane and solid

Topic Test — PART A

Instructions This part consists of 12 multiple-choice questions
Each question is worth 1 mark
Fill in only ONE CIRCLE for each question
Calculators are NOT allowed

Time allowed: 15 minutes **Total marks = 12**

		Marks
1	A rectangle is a Ⓐ prism Ⓑ pyramid Ⓒ cube Ⓓ plane shape	1
2	The number of vertices of a cube is Ⓐ 5 Ⓑ 6 Ⓒ 7 Ⓓ 8	1
3	The minimum number of sides of a polygon is Ⓐ 2 Ⓑ 3 Ⓒ 4 Ⓓ 5	1
4	The number of faces of a triangular pyramid is Ⓐ 2 Ⓑ 3 Ⓒ 4 Ⓓ 5	1
5	The number of parallel sides of a trapezium is Ⓐ 2 Ⓑ 3 Ⓒ 4 Ⓓ none of these	1
6	The number of dimensions of a plane figure is Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ none of these	1
7	The angle sum of a triangle is Ⓐ 90° Ⓑ 180° Ⓒ 270° Ⓓ 360°	1
8	The angle sum of a quadrilateral is Ⓐ 90° Ⓑ 180° Ⓒ 270° Ⓓ 360°	1
9	The number of edges of a cylinder is Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ 4	1
10	The number of equal sides in an isosceles triangle is Ⓐ 0 Ⓑ 1 Ⓒ 2 Ⓓ 3	1

Shapes, plane and solid

Topic Test — PART A continued

		Marks
11	The number of acute angles in an acute-angled triangle is Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ none of these	1
12	The number of obtuse angles in an obtuse-angled triangle is Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ none of these	1
13	Vertically opposite angles are Ⓐ equal Ⓑ unequal Ⓒ complementary Ⓓ supplementary	1
14	An equilateral triangle has Ⓐ 2 sides equal Ⓑ all sides equal Ⓒ all sides different Ⓓ one obtuse angle	1
15	The number of faces of a cube is Ⓐ 3 Ⓑ 4 Ⓒ 5 Ⓓ 6	1

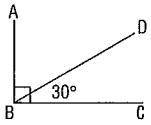
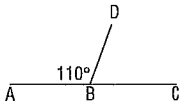
Total marks achieved for PART A ___/15

Shapes, plane and solid

Topic Test — PART B

Instructions This part consists of 15 questions
Each question is worth 1 mark
Write answers in the answers-only column

Time allowed: 20 minutes **Total marks = 15**

Questions	Answers only	Marks
1 How many faces does a rectangular prism have?		1
2 How many edges does a cone have?		1
3 Name two complementary angles in the diagram. 		1
4 What is the size of ∠ABD in the diagram?		1
5 Name two supplementary angles in the diagram. 		1
6 What is the size of ∠DBC in the diagram?		1
7 What is the angle sum of a triangle?		1
8 What is the angle sum of the two acute angles in a right-angled triangle?		1
9 How many axes of symmetry does a rectangle have?		1
10 Write the type of angle that measures 65°.		1
11 Write the name of the plane shape with eight sides.		1
12 How many axes of symmetry does a square have?		1
13 What is the size of each angle of an equilateral triangle?		1
14 Are all rectangles squares?		1
15 Are all squares rectangles?		1

Total marks achieved for PART B /15

Shapes, plane and solid

Topic Test — PART C

Instructions This part consists of 4 questions
Each question is worth 5 marks
Show all necessary

Time allowed: 20 minutes **Total marks = 20**

Questions **Marks**

1 Write the type of angle that measures ...

a 33° _____ b 90° _____

c 155° _____ d 265° _____

e 360° _____ 5

2 Write the name of the plane shape with ...

a three sides _____

b five sides _____

c eight sides _____

d ten sides _____

e twelve sides _____ 5

3 Complete the following sentences.

a A triangular pyramid has _____ faces.

b A cylinder has _____ circular faces.

c A square pyramid has _____ edges.

d A cone has _____ faces.

e A triangular prism has _____ vertices. 5

4 Draw the following solids and colour the base of each one.

a Rectangular prism b Cube

c Cylinder d Sphere

e Pentagonal pyramid 5

Total marks achieved for PART C /20

Shapes, plane and solid

Topic Test — PART A

Instructions This part consists of 12 multiple-choice questions
Each question is worth 1 mark
Fill in only ONE CIRCLE for each question
Calculators are NOT allowed

Time allowed: 15 minutes **Total marks = 12**

		Marks
1	A rectangle is a Ⓐ prism Ⓑ pyramid Ⓒ cube Ⓓ plane shape	1
2	The number of vertices of a cube is Ⓐ 5 Ⓑ 6 Ⓒ 7 Ⓓ 8	1
3	The minimum number of sides of a polygon is Ⓐ 2 Ⓑ 3 Ⓒ 4 Ⓓ 5	1
4	The number of faces of a triangular pyramid is Ⓐ 2 Ⓑ 3 Ⓒ 4 Ⓓ 5	1
5	The number of parallel sides of a trapezium is Ⓐ 2 Ⓑ 3 Ⓒ 4 Ⓓ none of these	1
6	The number of dimensions of a plane figure is Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ none of these	1
7	The angle sum of a triangle is Ⓐ 90° Ⓑ 180° Ⓒ 270° Ⓓ 360°	1
8	The angle sum of a quadrilateral is Ⓐ 90° Ⓑ 180° Ⓒ 270° Ⓓ 360°	1
9	The number of edges of a cylinder is Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ 4	1
10	The number of equal sides in an isosceles triangle is Ⓐ 0 Ⓑ 1 Ⓒ 2 Ⓓ 3	1

Shapes, plane and solid

Topic Test — PART A continued

		Marks
11	The number of acute angles in an acute-angled triangle is Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ none of these	1
12	The number of obtuse angles in an obtuse-angled triangle is Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ none of these	1
13	Vertically opposite angles are Ⓐ equal Ⓑ unequal Ⓒ complementary Ⓓ supplementary	1
14	An equilateral triangle has Ⓐ 2 sides equal Ⓑ all sides equal Ⓒ all sides different Ⓓ one obtuse angle	1
15	The number of faces of a cube is Ⓐ 3 Ⓑ 4 Ⓒ 5 Ⓓ 6	1

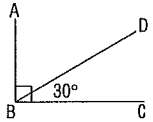
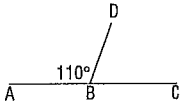
Total marks achieved for PART A ___/15

Shapes, plane and solid

Topic Test — PART B

Instructions This part consists of 15 questions
Each question is worth 1 mark
Write answers in the answers-only column

Time allowed: 20 minutes **Total marks = 15**

Questions	Answers only	Marks
1 How many faces does a rectangular prism have?		1
2 How many edges does a cone have?		1
3 Name two complementary angles in the diagram. 		1
4 What is the size of ∠ABD in the diagram?		1
5 Name two supplementary angles in the diagram. 		1
6 What is the size of ∠DBC in the diagram?		1
7 What is the angle sum of a triangle?		1
8 What is the angle sum of the two acute angles in a right-angled triangle?		1
9 How many axes of symmetry does a rectangle have?		1
10 Write the type of angle that measures 65°.		1
11 Write the name of the plane shape with eight sides.		1
12 How many axes of symmetry does a square have?		1
13 What is the size of each angle of an equilateral triangle?		1
14 Are all rectangles squares?		1
15 Are all squares rectangles?		1

Total marks achieved for PART B 15

Shapes, plane and solid

Topic Test — PART C

Instructions This part consists of 4 questions
Each question is worth 5 marks
Show all necessary

Time allowed: 20 minutes **Total marks = 20**

Questions **Marks**

1 Write the type of angle that measures ...

a 33° _____ b 90° _____

c 155° _____ d 265° _____

e 360° _____ 5

2 Write the name of the plane shape with ...

a three sides _____

b five sides _____

c eight sides _____

d ten sides _____

e twelve sides _____ 5

3 Complete the following sentences.

a A triangular pyramid has _____ faces.

b A cylinder has _____ circular faces.

c A square pyramid has _____ edges.

d A cone has _____ faces.

e A triangular prism has _____ vertices. 5

4 Draw the following solids and colour the base of each one.

a Rectangular prism b Cube

c Cylinder d Sphere

e Pentagonal pyramid 5

Total marks achieved for PART C 20

Answers – Shapes, plane and solid

Page 1 1 a • b ⟶ c •⟶ d •— • e ◡ f ⏐ 2 a // b ⊣⊢ c ∠ d ⌐ e ⌐

Page 2 1 a square b rectangle c parallelogram d rhombus e hexagon f kite 2 a triangle b quadrilateral c pentagon d hexagon e heptagon f octagon g nonagon h decagon i undecagon j dodecagon 3 a ⬠ b ⬡ c ⬡ d ⬡ e ⬡ f ⬡ g ⬡ h ⬡

Page 3 1 a circle b centre c radius d diameter e arc f chord 2 a semi-cirle b minor segment c major segment d sector e tangent f secant 3 a circumference b concentric circles c quadrant 4 a $\frac{1}{4}$ b $\frac{1}{2}$ c $\frac{3}{4}$ d $\frac{1}{6}$

Page 4 1 a 90° b 90° c 90°, 180° d 180° e 180°, 360° f 360° 2 a equal b 90° c 180° d 180° e 360° 3 a equal b equal c supplementary 4 a 60° b 130° c 70° d 55° e 50° f 60°

Page 5 1 a 1 b 2 c 4 d 1 e 1 f 1 g 1 h 1 2 a ◇ b ◇ c ⋈ 3 a H, I, O, X b F, G, J, L, N, P, Q, R, S, Z 4 b, c, d

Page 6 1 a all b two c no d all e one f one 2 a equal b equal c 180° d 60° e opposite interior 3 a △, 3, 3, 180° b △, 2, 1, 180° c △, 0, 0, 180° d △, 0, 0, 180° e ◿, 0, 0, 180° f ◿, 0, 0, 180°

Page 7 1 a square b rectangle c parallelogram d rhombus e trapezium f kite 2 a yes, yes, yes, yes, no, no b yes, yes, yes, yes, no, no c yes, yes, yes, yes, no, no d yes, yes, no, no, no, no e yes, yes, yes, yes, yes, yes f yes, yes, no, no, no, no g yes, yes, yes, yes, no, no h yes, no, no, yes, no, no i yes, no, no, yes, no, no

Page 8 1 a cubes b rectangular or triangular prisms c triangular prisms or pyramids d cylinders or cones 2 a hemisphere b 2 c 1 d 1 e 0 f 1 3 a ⬚, 6, 8, 12, yes b ⬚, 6, 8, 12, yes c ⬠, 5, 6, 9, yes d ⬡, 7, 10, 15, yes e ⬠, 5, 5, 8, yes f △, 4, 4, 6, yes

Page 9 1 a false b true c true d false e true f false 2 90° 3 60° 4 70° 5 80°, 100°, 100° 6 50° 7 cube 8 sphere 9 no 10 yes

Pages 10 & 11 1 D 2 D 3 B 4 C 5 A 6 B 7 B 8 D 9 B 10 C 11 C 12 A 13 A 14 B 15 D

Page 12 1 6 2 1 3 ∠ABD, ∠CBD 4 60° 5 ∠ABD, ∠CBD 6 70° 7 180° 8 90° 9 2 10 acute 11 octagon 12 4 13 60° 14 no 15 yes

Page 13 1 a acute b right angle c obtuse d reflex e revolution 2 a triangle b pentagon c octagon d decagon e dodecagon 3 a four b two c eight d two e six 4 a ⬚ b ⬚ c ⬭ d ○ e △