CHAPTER **10**
Measurement, area, surface area and volume

UNIT 1: Plane shapes

QUESTION **1**   Name the following triangles.

a

b

c

_____

d

e

f

_____

QUESTION **2**   Name the following quadrilaterals.

a

b

c

_____

d

e

f

_____

QUESTION **3**   Name the following polygons.

a

b

c

_____

d

e

f

_____

QUESTION **4**   Name the following shapes.

a

b

c

Measurement, area, surface area and volume

UNIT 2: Angle sum of plane shapes

QUESTION 1   Complete the following table.

	Name of the shape	Number of sides (n)	Number of triangles formed from one vertex ($n - 2$)	Angle sum of the shape $(n - 2)180°$
a	Triangle	3	1	$(3 - 2)180° = 180°$
b	Quadrilateral			
c	Pentagon			
d	Hexagon			
e	Heptagon			
f	Octagon			
g	Nonagon			
h	Decagon			
i	Undecagon			
j	Dodecagon			
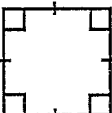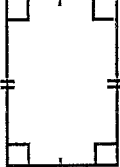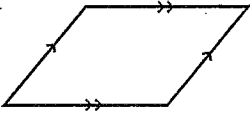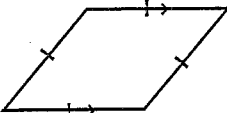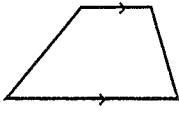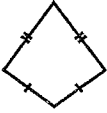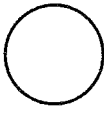
QUESTION 2   Complete the following sentences.

a   The angle sum of a triangle is equal to _____
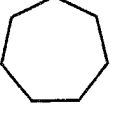
b   The angle sum of a quadrilateral is equal to _____

c   The angle sum of a pentagon is equal to _____

d   The angle sum of a hexagon is equal to _____

e   The angle sum of a heptagon is equal to _____

f   The angle sum of an octagon is equal to _____

g   The angle sum of a nonagon is equal to _____

h   The angle sum of a decagon is equal to _____

i   The angle sum of an undecagon is equal to _____

j   The angle sum of a dodecagon is equal to _____

k   The angle sum of a polygon with n sides is equal to _____

l   The angle sum of the exterior angles of a polygon is always equal to _____
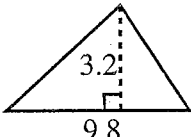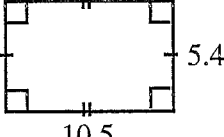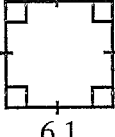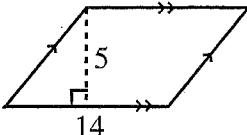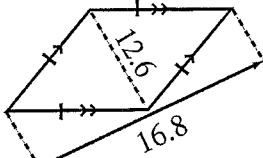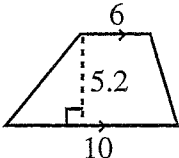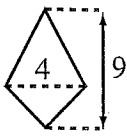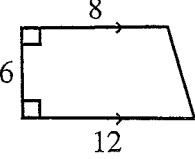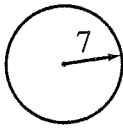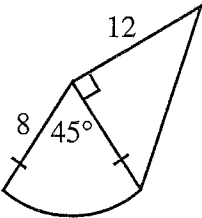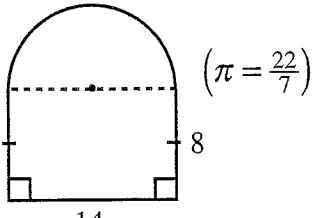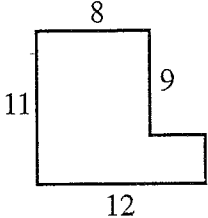
Measurement, area, surface area and volume

UNIT 3: Areas of plane shapes

QUESTION 1   Write the area formula next to the shapes given below.

a

b

c

d

e

f

g

h

i

QUESTION 2   Find the area of the following shapes. All measurements are in centimetres.

a
3.2
9.8

b
5.4
10.5

c
6.1

d
5
14

e
12.6
16.8

f
6
5.2
10

g
4   9

h
8
6
12

i
7

j
12
8   45°

k
$\left(\pi = \frac{22}{7}\right)$
8
14

l
8
9
11
12

Measurement, area, surface area and volume

UNIT 4: Surface area of a solid

QUESTION 1   Find the surface area of the following rectangular prisms.

a

6 cm
9 cm
7 cm

b

4.5 cm
4.5 cm
4.5 cm

c

5.2 cm
16.3 cm
4.9 cm

_____   _____   _____
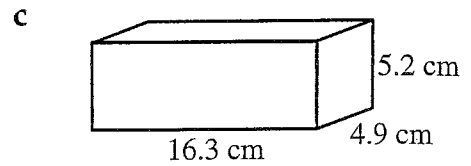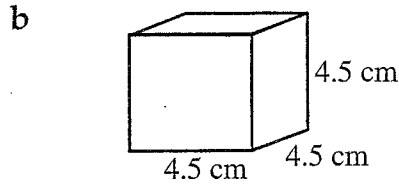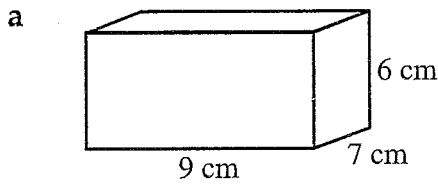
QUESTION 2   Find the surface area of the following triangular prisms.

a

8 cm
12 cm
20 cm
10 cm

b

10.8 cm
9 cm
12 cm
18 cm

c

4 cm
5 cm
3 cm
14.6 cm

_____   _____   _____
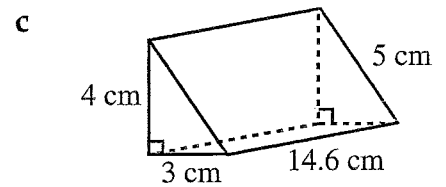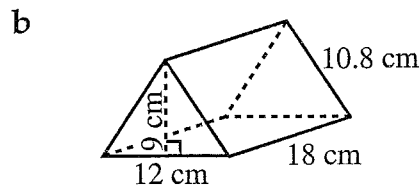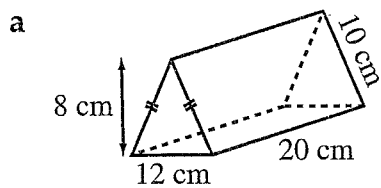
QUESTION 3   Find the surface area of the following trapezoidal prisms.

a

10 m
6 m
3 m
14 m
8.5 m

b

12 m
8 m
1.75 m
2.5 m
13.4 m

c

15 m
16.5 m
6 m
21 m
8.7 m

_____   _____   _____
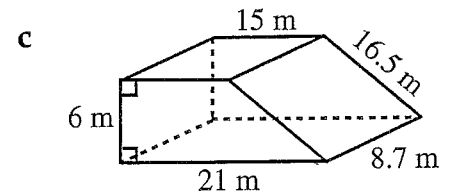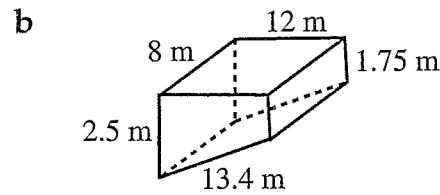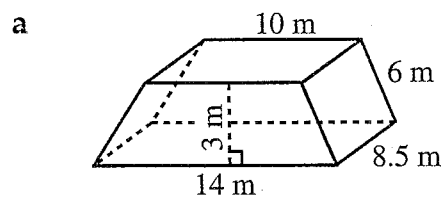
QUESTION 4   Find the surface area of the following cylinders.

a

5 cm
11 cm

b

12 cm
6 cm

c

14 cm
20.7 cm

_____   _____   _____
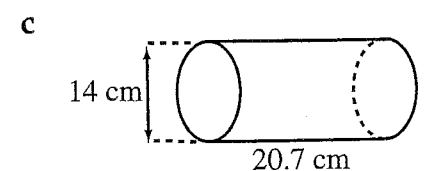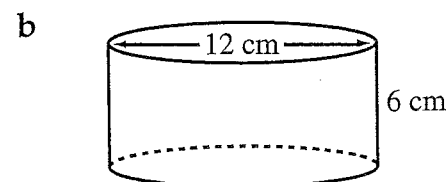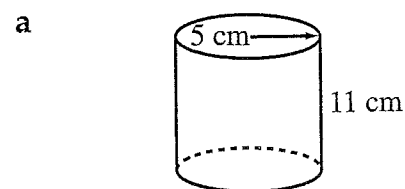
Measurement, area, surface area and volume

UNIT 5: Volume of a prism

QUESTION 1   Find the volume of the following rectangular prisms (give answers correct to one decimal place).

a

5.8 cm
5.8 cm   5.8cm

b

3.5 cm
9.6 cm   5.6 cm

c

3.7 c
15.6 cm   3.7 cm

_____   _____   _____
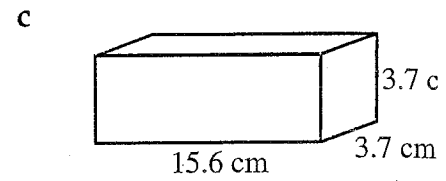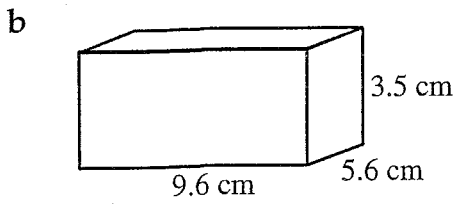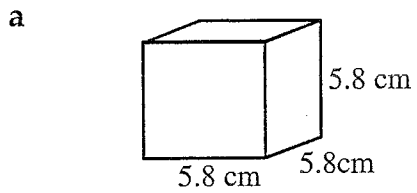
QUESTION 2   Find the volume of the following triangular prisms (give answers correct to four significant figures).

a

8 cm
10 cm   30.5 cm

b

7.8 cm
5.4 cm   10.6 cm

c

7 cm
12.6 cm   28 cm

_____   _____   _____
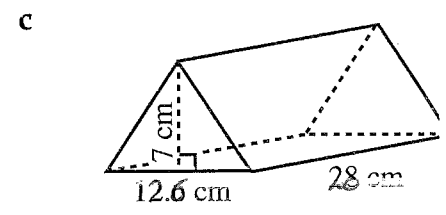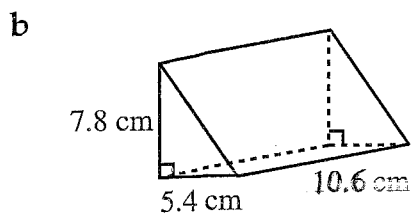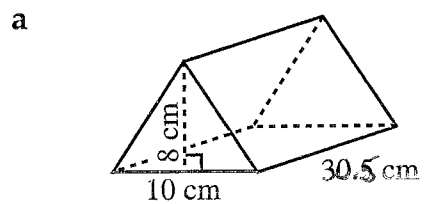
QUESTION 3   Find the volume of the following trapezoidal prisms (give answers correct to two decimal places).
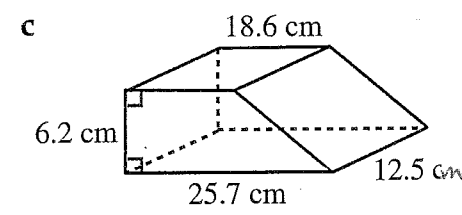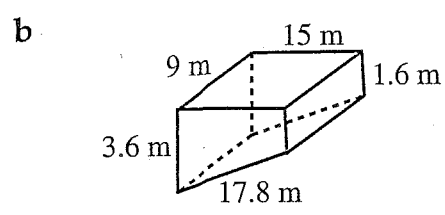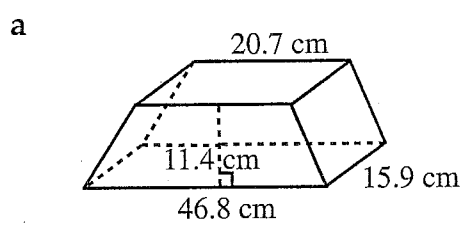
a

20.7 cm
11.4 cm   15.9 cm
46.8 cm

b

15 m
9 m   1.6 m
3.6 m
17.8 m

c

18.6 cm
6.2 cm
25.7 cm   12.5 cm

_____   _____   _____

QUESTION 4   Find the volume of the following solids.

a

3 m
5 m
10 m   16.5 m

b

14 m   6 m
10 m
16 m   12 m

c

4 m   4 m
3 m
12 m   10 m

_____   _____   _____
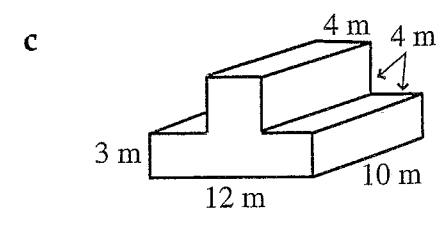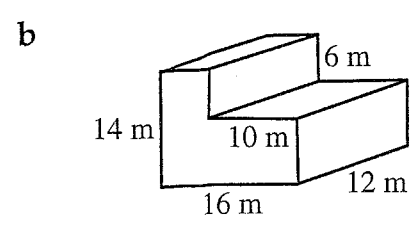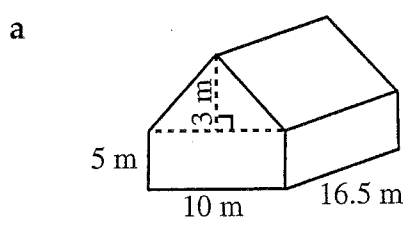
Measurement, area, surface area and volume

UNIT 6: Volume of a cylinder

QUESTION 1   Find the volume of the following cylinders (correct to one decimal place).

a

6 cm
10 cm

b

15 cm
8 cm

c

12.5 cm
7 cm
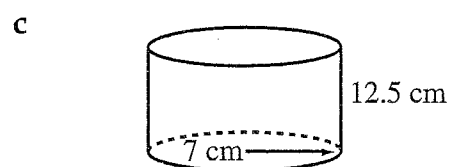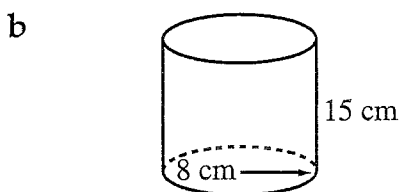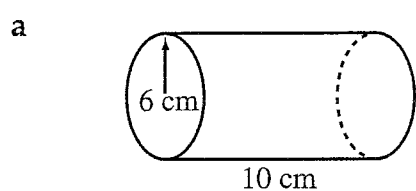
QUESTION 2   Find the volume of the following cylinders (correct to three significant figures).

a

8 cm
12 cm

b

10 cm
28 cm

c

6 cm
15.4 cm
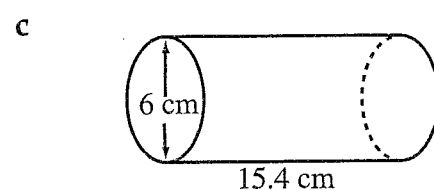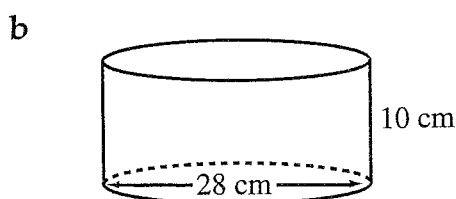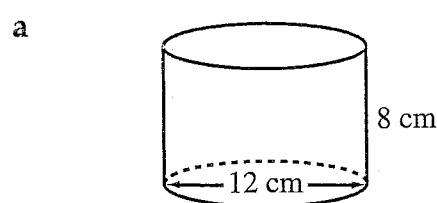
QUESTION 3   Find the volume of the following (correct to two decimal places).

a

5.6 cm
3 cm

b

14 cm
25 cm

c

10.8 cm
14.5 cm
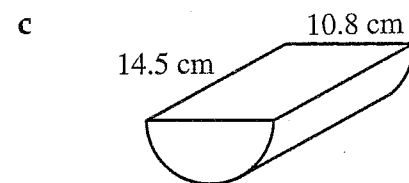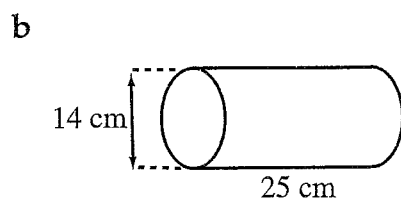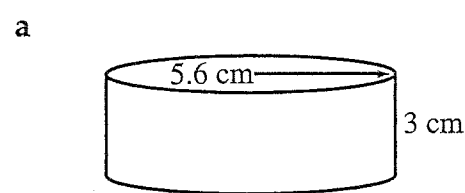
QUESTION 4   Find the volume of the following solids (correct to one decimal place).

a

25 cm
17.6 cm
(diameter of hole = 8 cm)

b

21 cm
2 cm
8.3 cm
7 cm

c

9 cm
12 cm
10 cm
(diameter of hole = 7 cm)
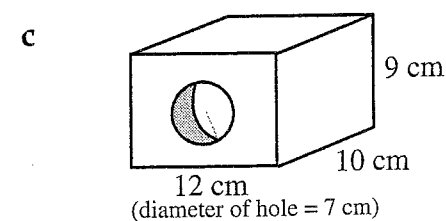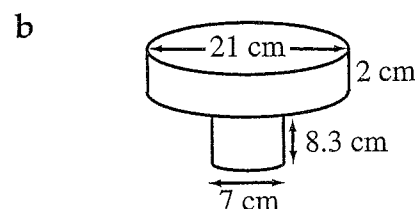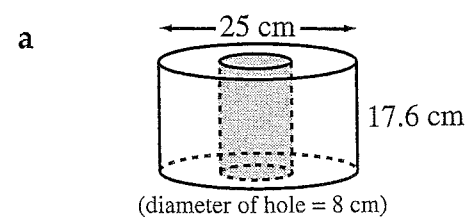
Measurement, area, surface area and volume

Instructions for SECTION 1
- You have 15 minutes to answer Section 1
- Each question is worth 2 marks
- Attempt ALL questions
- Calculators are NOT to be used
- Fill in only ONE CIRCLE for each question

Marks

1 Find the area of a square with side length 12 cm.

Ⓐ 48 cm²   Ⓑ 288 cm²   Ⓒ 144 cm²   Ⓓ None of these   2

**2** Calculate the volume of a cube with side length 5 cm.

Ⓐ 30 cm³   Ⓑ 125 cm³   Ⓒ 150 cm³   Ⓓ None of these   2

3 A rectangular prism has sides of length 9 cm, 11 cm and 12 cm. Find its volume.

Ⓐ 32 cm³   Ⓑ 339 cm³   Ⓒ 594 cm³   Ⓓ 1188 cm³   2

4 A cube has a volume of 4913 cm³. Find the length of each side of the cube.

Ⓐ 70 cm   Ⓑ 8.4 cm   Ⓒ 181 cm   Ⓓ 17 cm   2

5 Find the perimeter of a square of side 4.2 cm.

Ⓐ 17.64 cm   Ⓑ 74.1 cm   Ⓒ 16.8 cm   Ⓓ None of these   2

6 If the perimeter of a square is 36 cm, then the area of the square is

Ⓐ 6 cm²   Ⓑ 9 cm²   Ⓒ 36 cm²   Ⓓ 81 cm²   2

7 How many square centimetres are there in a square metre?

Ⓐ 100   Ⓑ 1000   Ⓒ 10 000   Ⓓ 100 000   2

8 The radius of the Earth is approximately 6400 km. What is the circumference of the Earth at the equator?

Ⓐ 40 212 km   Ⓑ 1.29×10^8 km   Ⓒ 20 106 km   Ⓓ 38 340 km   2

9 What is the area of a circle of radius 3.2 m? Answer to the nearest square metre.

Ⓐ 101 m²   Ⓑ 32 m²   Ⓒ 129 m²   Ⓓ 8 m²   2

10 The volume of a rectangular prism is 216 cm³. Find the total surface area of a cube having the same volume.

Ⓐ 64 cm²   Ⓑ 216 cm²   Ⓒ 144 cm²   Ⓓ 196 cm²   2

Total marks achieved for SECTION 1   2

Measurement, area, surface area and volume

**Instructions for SECTION 2**
- You have 20 minutes to answer ALL of Section 2
- Each question is worth 2 marks
- Attempt ALL questions
- Calculators may be used

Questions	Answers	Marks
1 State the formula for the area of a circle.	_____	2
2 Convert 1.68 m² to cm².	_____	2
3 What is the side length of a square that has an area of 160 000 m²?	_____	2
4 How many square metres in 2 hectares?	_____	2
5 Calculate the surface area of a cube of side 2.5 m.	_____	2
6 Calculate the volume of a rectangular prism 3.5 m long, 3.4 m wide and 2.8 m high.	_____	2
7 Calculate the circumference of a circle with radius equal to 5 cm.	_____	2
For the solid given opposite, calculate:		
8 the area of rectangle *BCDH*.	_____	2
9 the area of triangle *ABH*.	_____	2
10 the area of *AHFG*.	_____	2
11 the total surface area.	_____	2
12 the volume.	_____	2
13 A cube has a volume of 3375 cm³. Find the length of each side of the cube.	_____	2
14 Find the perimeter of a square of side 5.6 cm.	_____	2
15 The volume of a cube is 216 cm³. Find its surface area.	_____	2

For questions 8–12, diagram:
G, A, F, B, H, E, C — 5 m, 4 m, 10 m, 8 m

Total marks achieved for SECTION 2 /30
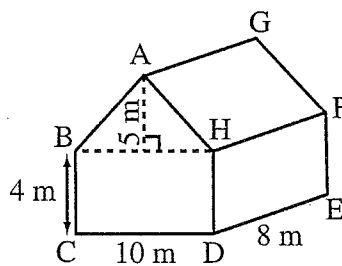
Answers

PAGE 1 1 a acute angled triangle b right angled triangle c obtuse angled triangle d scalene triangle e equilateral triangle f isosceles triangle
2 a square b rectangle c parallelogram d rhombus e trapezium f kite 3 a pentagon b hexagon c heptagon d octagon e nonagon
f decagon 4 a circle b ellipse c sector

PAGE 2 1 a 3, 1, 180° b 4, 2, 360° c 5, 3, 540° d 6, 4, 720° e 7, 5, 900° f 8, 6, 1080° g 9, 7, 1260° h 10, 8, 1440° i 11, 9, 1620°
j 12, 10, 1800° 2 a 180° b 360° c 540° d 720° e 900° f 1080° g 1260° h 1440° i 1620° j 1800° k $(n-2)180°$ l 360°

PAGE 3 1 a $A = \frac{1}{2}bh$ b $A = s^2$ c $A = lb$ d $A = bh$ e $A = \frac{1}{2}xy$ f $A = \frac{1}{2}h(a+b)$ g $A = \frac{1}{2}xy$ h $A = \pi r^2$ i $A = \frac{\theta}{360°} \times \pi r^2$
2 a 15.68 cm² b 56.7 cm² c 37.21 cm² d 70 cm² e 105.84 cm² f 41.6 cm² g 18 cm² h 60 cm² i 153.9 cm² j 73.1 cm² k 189 cm² l 96 cm²

PAGE 4 1 a 318 cm² b 121.5 cm² c 380.22 cm² 2 a ~~702.4~~ 736 cm² b 712.8cm² c 187.2 cm² 3 a 378 m² b 288.2 m² c 724.95 m²
4 a 502.65 cm² b 452.4 cm² c 1218.3 cm²

PAGE 5 1 a 195.1 cm³ b 188.2 cm³ c 213.6 cm³ 2 a 1220 cm³ b 223.2 cm³ c 1235 cm³ 3 a 6117.53 cm³ b 351 m³ c 1716.63 cm³
4 a 1072.5 m³ b 1968 m³ c 520 m³

PAGE 6 1 a 1131.0 cm³ b 3016.0 cm³ c 1924.2 cm³ 2 a 905 cm³ b 6160 cm³ c 435 cm³ 3 a 295.56 cm³ b 3848.45 cm³
c 664.16 cm³ 4 a 7754.7 cm³ b 1012.1 cm³ c 695.2 cm³

PAGE 7 1 C 2 B 3 D 4 D 5 C 6 D 7 C 8 A 9 B 10 B

PAGE 8 1 $A = \pi r^2$ 2 16 800 cm² 3 400 m 4 20 000 m² 5 37.5 m² 6 33.32 m³ 7 31.4 cm 8 40 m² 9 25 m² 10 56.57 m²
11 387.14 m² 12 520 m³ 13 15 m 14 22.4 cm 15 216 cm²