Surface Area Review

1 Find the total surface areas of the solids shown.

a

10 cm

b

8 cm

c

12 cm
15 cm
20 cm

d

2 m
1.5 m
3 m
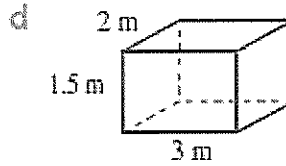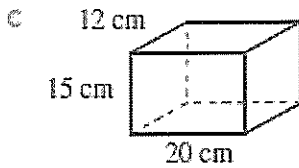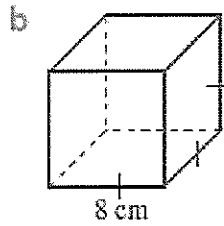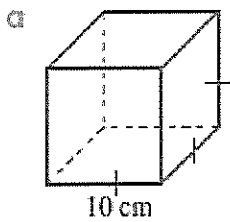
2 **WE3** Find the total surface area of the solids shown below.

a

r = 3 m

b

21 cm
30 cm

c

0.5 m
2.1 m

d

12 cm
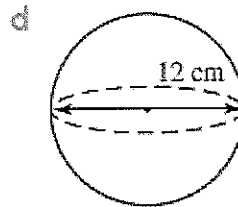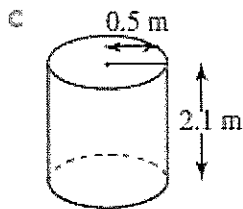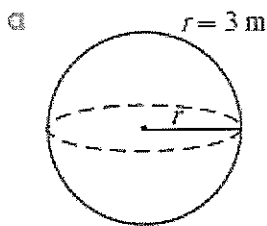
4 **WE5** Find the total surface area of the solids below.

c

9.1 cm
8 cm
14 cm
5.1 cm
7.2 cm

d

6 cm
10 cm
7 cm
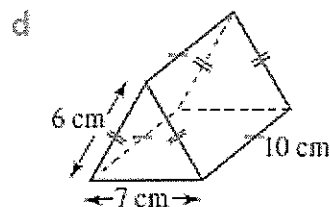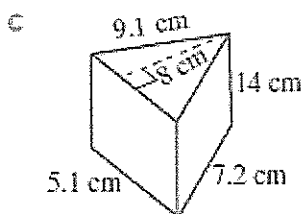
5 Find the surface areas of the following.

a A cube of side length 1.5 m

b A rectangular prism 6 m × 4 m × 2.1 m

c A cylinder of radius 30 cm and height 45 cm, open at one end
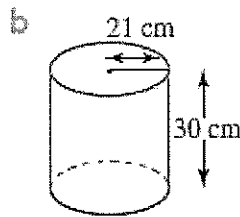
d A sphere of radius 28 mm

e An open cone of radius 4 cm and slant height 10 cm

f A square pyramid of base length 20 cm and slant edge 30 cm

6 **WE:** Find the total surface area of the objects shown.

a

8 cm
10 cm
5 cm 12 cm
5 cm
20 cm

b

20 cm
12 cm
35 cm

f

5 cm
20 cm
12 cm
15 cm
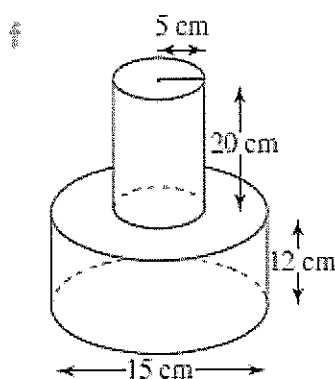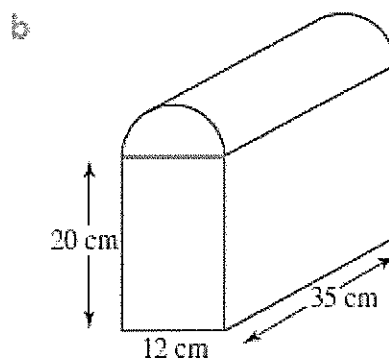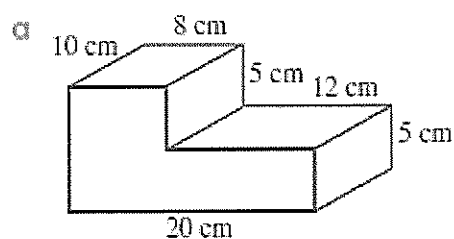
7 **MC** A cube has a total surface area of 384 cm². The length of the edge of the cube is:

A 9 cm   B 8 cm   C 7 cm

D 6 cm   E 5 cm

9 A steel girder is to be painted. Calculate the area of the surface to be painted.

12 cm
12 cm
5 cm
20 cm
120 cm
2 cm
12 cm
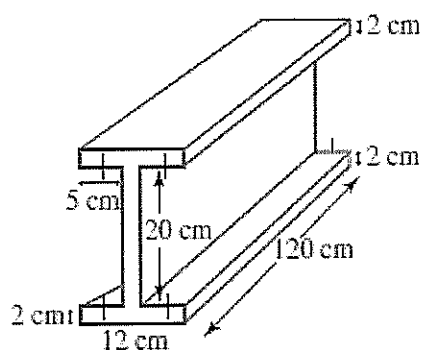
10 **WE:** The greenhouse shown below is to be built using shade cloth. It has a wooden door of dimensions 1.2 m × 0.5 m.

a Find the total area of shade cloth needed to complete the greenhouse.

b Find the cost of the shade cloth at $6.50 per m².

2.5 m
5 m
3 m
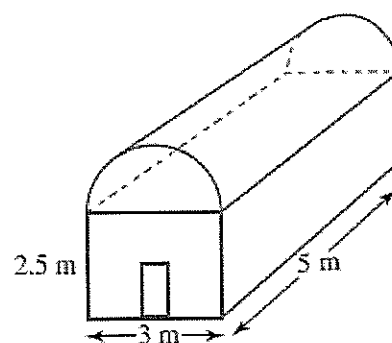
Volume Review

1 Find the volumes of the following prisms.

a

3 cm

b

4.2 m

c

12 cm

15 cm

20 cm

d

4.2 cm

7.5 cm

3 cm
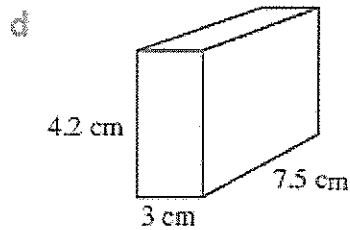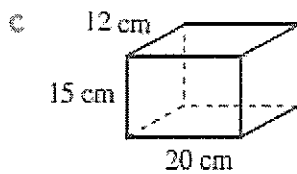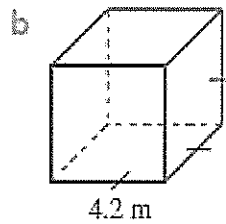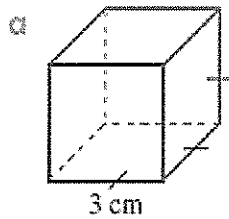
2 Calculate the volume of each of these solids.

a

18 mm

[Base area: 25 mm²]

b

15 cm

[Base area: 24 cm²]
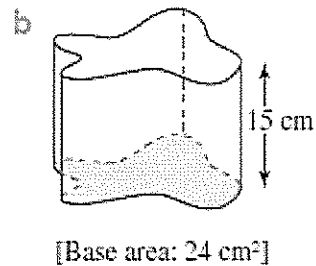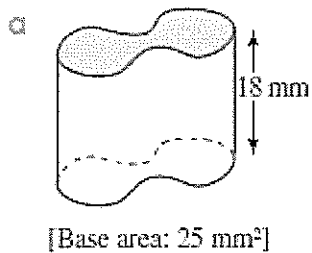
3 WEB Find the volume of each of the following. Give each answer correct to 1 decimal place where appropriate.

a

14 cm

12 cm

b

2.7 m

1.5 m

c

10 cm

7 cm

8 cm

d

12 mm

8 mm

6 mm

e

6.5 m

35°

7.1 m

f

45 cm

18 cm
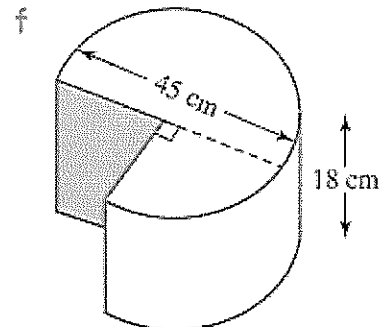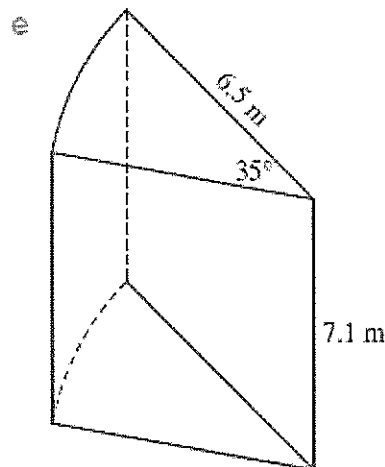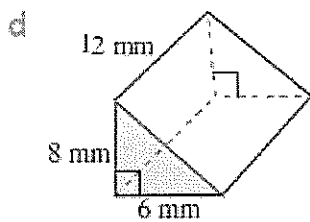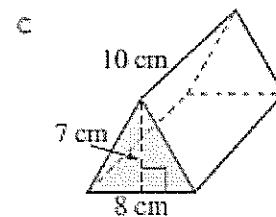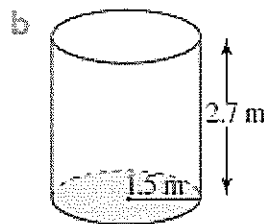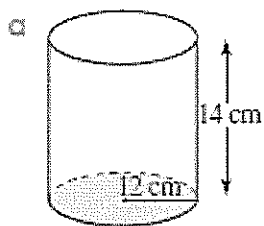
8 **WE12** Calculate the volume of each of the following composite solids correct to 2 decimal places where appropriate.

a

b
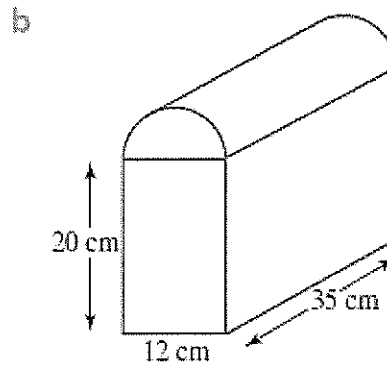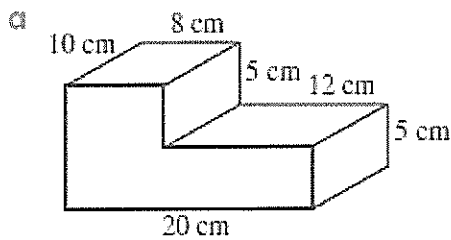
9 **WE13** a What effect will tripling each of the side lengths of a cube have on its volume?

b What effect will halving each of the side lengths of a cube have on its volume?

c What effect will doubling the radius and halving the height of a cylinder have on its volume?

12 **WE15** A cylindrical water tank has a diameter of 1.5 m and a height of 2.5 m. What is the capacity (in litres) of the tank?

Exercise 6B — Total surface area

1 a 600 cm²   b 384 cm²   c 1440 cm²
   d 27 m²
2 a 113.1 m²   b 6729.3 cm²   c 8.2 m²
   d 452.4 cm²
3 a 1495.4 cm²   b 502.7 cm²
4 a 506.0 cm²   b 9.4 m²   c 340.4 cm²
   d 224.1 cm²
5 a 13.5 m²   b 90 m²   c 11 309.7 cm²
   d 9852.0 mm²   e 125.7 cm²   f 1531.4 cm²
6 a 880 cm²   b 3072.8 cm²   c 75 cm²
   d 70.4 cm²   e 193.5 cm²   f 1547.2 cm²
7 B   8 60
9 11 216 cm²
10 a 70.0 m²   b $455

Exercise 6C — Volume

1 a 27 cm³   b 74.088 m³
   c 3600 cm³   d 94.5 cm³
2 a 450 mm³   b 360 cm²
3 a 6333.5 cm³   b 19.1 m³
   c 280 cm³   d 288 mm³
   e 91.6 m³   f 21 470.8 cm³

8 a 1400 cm³   b 10 379.20 cm³   c 41.31 cm³
   d 48.17 cm³   e 218.08 cm³   f 3691.37 cm³
9 a $V_{new} = 27l^3$, the volume will be 27 times as large as the original volume.
   b $V_{new} = \frac{1}{8}l^3$, the volume will be $\frac{1}{8}$ of the original volume.
   c $V_{new} = 2\pi r^2 h$, the volume will be twice as large as the original volume.

12 4417.9 L

Linear Relationships Review

1 The equation of the following line is:
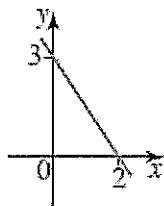
  A $3x + 2y = 6$ B $3x - 2y = 6$ C $2x + 3y = 6$

  D $2x - 3y = 6$ E $2x - 3y = -6$

2 The equation of a linear graph with gradient -3 and x-intercept of 4 is:

  A $y = -3x - 12$ B $y = -3x + 4$ C $y = -3x - 4$

  D $y = -3x + 12$ E $y = 4x - 3$

3 The equation of a linear graph which passes through $(2, -7)$ and $(-2, -2)$ is:

  A $4x - 5y + 18 = 0$ B $5x + 4y + 18 = 0$ C $5x + 4y - 18 = 0$

  D $5x - 4y - 18 = 0$ E $4x + 5y + 18 = 0$

4 The distance between the points $(1, 5)$ and $(6, -7)$ is:

  A $\sqrt{53}$ B $\sqrt{29}$ C 13 D $\sqrt{193}$ E 12

5 The midpoint of the line segment joining the points $(-4, 3)$ and $(2, 7)$ is:

  A $(-1, 5)$ B $(-2, 10)$ C $(-6, 4)$ D $(-2, 4)$ E $(-1, 2)$

6 If the midpoint of the line segment joining the points A $(3, 7)$ and B (x, y) has coordinates $(6, 2)$, then the coordinates of B are:

  A $(15, 3)$ B $(0, -6)$ C $(9, -3)$ D $(4.5, 4.5)$ E $(-9, 3)$

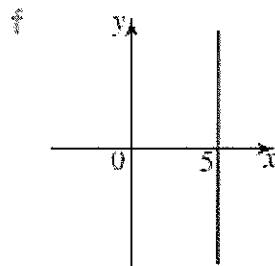7 If the points $(-6, -11)$, $(2, 1)$ and $(x, 4)$ are collinear, then the value of x is:

  A 4 B 3.2 C $\frac{1}{4}$ D $\frac{5}{16}$ E 3

8 The gradient of the line perpendicular to $3x - 4y + 7 = 0$ is:

  A $\frac{3}{4}$ B $\frac{4}{3}$ C $-\frac{4}{3}$ D 3 E -4

9 The equation of the line perpendicular to $2x + y - 1 = 0$ and passing through the point $(1, 4)$ is:

  A $2x + y - 6 = 0$ B $2x + y - 2 = 0$ C $x - 2y + 7 = 0$

  D $x + 2y + 9 = 0$ E $x - 2y = 0$

16 Find the equations of the straight lines in the following graphs.

a

b

c

d

e

f
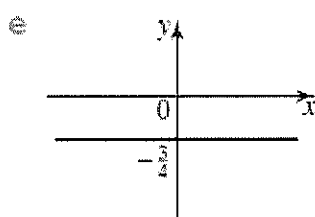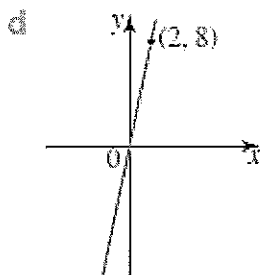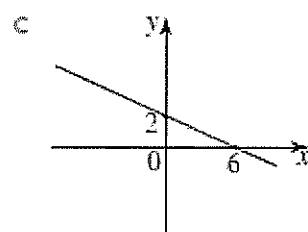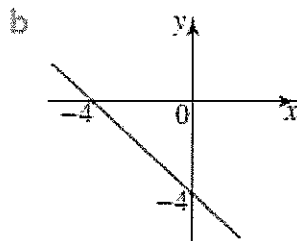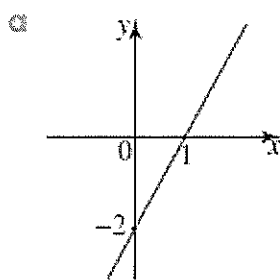
17 Find the linear equation given the information in each case below.

 a gradient $= 3$, y-intercept $= -4$ b gradient $= -2$, y-intercept $= -5$

 c gradient $= \frac{1}{2}$, y-intercept $= 5$ d gradient $= 0$, y-intercept $= 6$

18 For each of the following, find the equation of the straight line with the given gradient and passing through the given point.

 a gradient $= 7$, point $(2, 1)$ b gradient $= -3$, point $(1, 1)$

 c gradient $= \frac{1}{2}$, point $(-2, 5)$ d gradient $= \frac{3}{5}$, point $(1, -3)$

Chapter review

Fluency

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

16 a $y = 2x - 2$ b $y = -x - 4$ c $y = -\frac{1}{3}x + 2$

   d $y = 4x$ e $y = -\frac{3}{4}$ f $x = 5$

17 a $y = 3x - 4$ b $y = -2x - 5$

   c $y = \frac{1}{2}x + 5$ d $y = 6$

18 a $y = 7x - 13$ b $y = -3x + 4$

   c $y = \frac{1}{2}x + 6$ d $y = \frac{3}{5}x - \frac{18}{15}$

2 For each of the following data sets, find the range.

a 4, 3, 6, 7, 2, 5, 8, 4, 3

b

x	13	14	15	16	17	18	19
f	3	6	7	12	6	7	8

c Key: $1 \mid 8 = 18$

Stem	Leaf
1	7 8 8 9
2	1 2 4 4 5 7 7 7 8 9 9
3	0 0 0 1 3 4 7

3 For each of the following data sets, find the interquartile range.

a 18, 14, 15, 19, 20, 11, 16, 19, 18, 19

b Key: $9 \mid 8 = 9.8$

Stem	Leaf
8	7 8 8 9
9	0 2 4 4 5 7 7 7 8 9 9
10	0 1 1 1 3

4 The following back-to-back stem-and-leaf plot shows the typing speed in words per minute (wpm) of 30 Year 8 and Year 10 students.

Key: $2 \mid 6 = 26$ wpm

Leaf Year 8	Stem	Leaf Year 10
9 9	0	
9 8 6 5 4 2 0	1	7 9
9 8 8 6 4 2 1 0 0	2	2 3 6 8 9
9 7 7 6 4 1 0	3	0 2 4 5 5 7 8 8
8 6 5 2 0	4	1 2 5 8 8 9 9
	5	0 3 5 7 8
	6	0 0 3

a Using a calculator or otherwise, construct a pair of parallel box-and-whisker plots to represent the two sets of data.

b Find the mean, median, range, interquartile range and standard deviation of each set.

c Compare the two distributions, using your answers to parts a and b.

5 Consider the box-and-whisker plot drawn below.
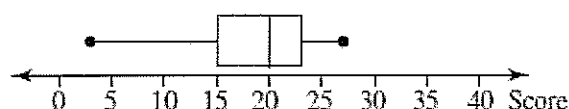
a Find the median.

b Find the range.

c Find the interquartile range.
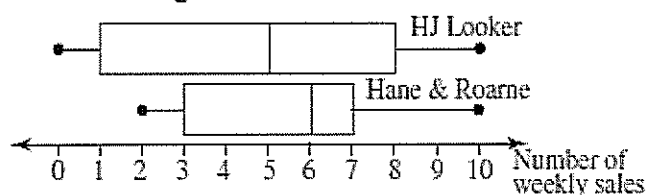
12 Consider the box-and-whisker plot below which shows the number of weekly sales of houses by two real estate agencies.

a What is the median number of weekly sales for each real estate agency?

b Which agency had the greatest range of sales?

c Which agency had the greatest interquartile range of sales?

d Which agency performed better? Explain your answer.

14 Consider the data set represented by the frequency histogram below.
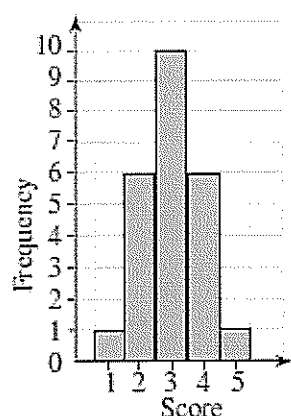
a Are the data symmetrical?

b Can the mean and median of the data be seen? If so, what are their values?

c What is the mode of the data?

15 The table below shows the number of cars that are garaged at each house in a certain street each night.
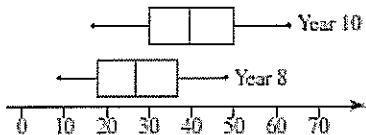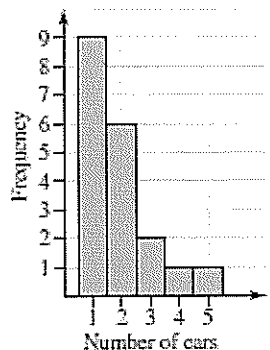
Number of cars	Frequency
1	9
2	6
3	2
4	1
5	1

a Show these data in a frequency histogram.

b Are the data positively or negatively skewed? Justify your answer.

16 Find the mean, median and mode of this data set: 2, 5, 6, 2, 5, 7, 8. Comment on the shape of the distribution.

Fluency

1 a Mean = 11.55; median = 10; mode = 8
  b Mean = 36; median = 36; mode = 33, 41
  c Mean = 72.18; median = 72; mode = 72
2 a 6   b 6   c 20
3 a 4   b 8.5

4 a

  b Year 8: mean = 26.83, median = 27, range = 39,
         IQR = 19, sd = 11.45
    Year 10: mean = 40.7, median = 39.5, range = 46,
           IQR = 20, sd = 12.98
  c The typing speed of Year 10 students is about 13 to 14 wpm
    faster than that of Year 8 students. The spread of data in Year 8
    is slightly less than in Year 10.
5 a 20   b 24   c 8

12 a HJ Looker: median = 5;
     Hane and Roarne: median = 6
   b HJ Looker
   c HJ Looker
   d Hane and Roarne had a higher median and a lower spread and
     so they appear to have performed better.
13 a English: mean = 70.25; Maths: mean = 69
   b English: range = 53; Maths: range = 37
   c English: $\sigma = 16.1$; Maths: $\sigma = 13.4$
   d Kloe has performed more consistently in Maths as the range
     and standard deviation are both lower.
14 a Yes
   b Yes. Both are 3.
   c 3
15 a

   b Positively skewed — a greater number of scores is distributed
     at the lower end of the distribution.

16 Mean = 5, median = 5, mode = 2 and 5. The distribution is
   positively skewed and bimodal.