# Unit 5: Area and volume

The book.

## Chapter 5

### Check in

1 a 130 b 0.03 c 70 d 26.4
e 270 f 0.0138

2 a i 600 ii 240 b i 70 ii 73
iii 2000 iv 2600

3 a 24 $cm^2$ b 35 $m^2$

### Exercise 5A

1 a 200 $mm^2$ b 4100 $mm^2$ c 360 $mm^2$ d 1792 $mm^2$

2 a 3 $cm^2$ b 0.3 $cm^2$ c 1.93 $cm^2$ d 48.24 $cm^2$

3 a 40 000 $cm^2$ b 30 000 $cm^2$
c 26 000 $cm^2$ d 2000 $cm^2$

4 a 9 000 000 $mm^2$ b 3 000 000 $mm^2$
c 2 700 000 $mm^2$ d 50 000 $mm^2$

5 a 2 $m^2$ b 5 $m^2$ c 3 $m^2$ d 7 $m^2$

6 a 50 000 $cm^2$ b 0.000 06 $m^2$ c 8 200 000 $mm^2$

7 a 4000 $m^2$ b 52 $km^2$ c 21 000 $m^2$ d 0.37 $km^2$

8 75 $m^2$

9 a 2 ha b 31 ha c 0.06 ha d 500 ha

10 a 30 000 $m^2$ b 47 100 $m^2$ c 720 $m^2$ d 5000 $m^2$

11 a 300 ha b 10 ha c 240 ha d 3200 ha

12 a 4 $km^2$ b 0.23 $km^2$ c 50 $km^2$ d 541 $km^2$

13 1457 ha

14 Wadi Shih Reservoir, United Arab Emirates 5 $km^2$
Lake Taupo, New Zealand 613 $km^2$
Danau Toba, Indonesia 1130 $km^2$
Kainji Lake, Nigeria 1243 $km^2$
Lake Nasser, Egypt 5250 $km^2$

**15** 3.1 ha

**16** 2 m or 200 cm

**17** 300 tiles

**18** 540 $cm^2$

**19** **a** 30 business cards **b** 1200 $cm^2$ **c** 133 $cm^2$

## Exercise 5B

**1** **a** 2 $cm^2$ **b** 4 $cm^2$ **c** 3 $cm^2$ **d** 3 $cm^2$
**e** $4\frac{1}{2}$ $cm^2$ **f** 3 $cm^2$ **g** 6 $cm^2$

**2** **a**

| Area of surrounding rectangle ($cm^2$) | 4 | 8 | 6 | 6 | 9 | 6 | 12 |
|---|---|---|---|---|---|---|---|
| Area of triangle ($cm^2$) | 2 | 4 | 3 | 3 | $4\frac{1}{2}$ | 3 | 6 |

**b** The values in the second row are half the values in the first row.

**c** Area of triangle $= \frac{1}{2} \times$ area of surrounding rectangle

**3** **a** 18 $cm^2$ **b** $\frac{1}{2}$ **c** 9 $cm^2$

**4** **a** 6 $cm^2$ **b** $4\frac{1}{2}$ $cm^2$

**5** **a** yes **b** 24 $cm^2$

## Exercise 5C

**1** **a** 43.2 $cm^2$ **b** 82.5 $cm^2$

**2** Answers may vary due to student's own measurements
**a** 22.1 $cm^2$ **b** 2.295 $cm^2$

**3** **a** 20 $cm^2$ **b** 12 cm **c** 27 $cm^2$ **d** 12 cm
**e** 28.98 $cm^2$

**4** **a** 16.8 cm **b** 12.4 cm **c** 12 m **d** 12 cm

**5** 13 $m^2$

**6** $120\,cm^2$

**7** $108\,cm^2$

**8** **a** $33\ m^2$ **b** $51\ m^2$

**9** $88\ m^2$

**10** **a** $40\,cm^2$ **b** $80\,cm^2$ **c** $48\,cm^2$ **d** $53\frac{1}{3}cm^2$

## Exercise 5D

**1** **a** $14\,cm^3$ **b** $25\,cm^3$

**2** **a** $27\,cm^3$ **b** $57\,cm^3$

**4** **a**

| | Number of cubes long L | Number of cubes wide W | Number of cubes high H | L × W × H | Total number of cubes |
|---|---|---|---|---|---|
| A | 3 | 3 | 4 | 36 | 36 |
| B | 6 | 3 | 2 | 36 | 36 |
| C | 5 | 3 | 3 | 45 | 45 |

**b** They are equal

**5** 72

## Exercise 5E

**1** **a** $18\,cm^3$ **b** $30\,m^3$ **c** $18\,mm^3$

**3** Volume $(cm^3)$: 8, 30, 78, 33.75

**4** 5, 5, 10, 4

**5** $960\,cm^3$

**6** $200\,000\,cm^3$ or $0.2\,m^3$

**7** $x = 12$

**8** **b** Not many items would fit in a box with such a small length and width

**9** **a** 5 cm **b** 3.5 cm **c** 0.4 m **d** 4 cm

**10** 3 m

**11** 48

**12** 30

**13** 30 *l*

**14** **a** **i** 6 **ii** 6 000 000 **b** 6000 *l*

**15** 1 m

**16** $y = 2.6$

**17** 90

**18** **a** $153\,000\,mm^3$ **b** $190\,cm^3$

**19** 55

## Exercise 5F

**1** **a** $6\,cm^2$ **b** $54\,cm^2$

**2** $144\,cm^2$

**3** **a** $96\,cm^2$, $384\,cm^2$. Total = $480\,cm^2$

**b** It is multiplied by 4.

**4** **a** $158\,cm^2$ **b** $72\,cm^2$ **c** $186.22\,cm^2$

**d** $101.26\,cm^2$

**7** 9 cm

**8** **a** $50\,m^2$ **b** 8.9 litres

**9** **a** $52\,cm^2$ **b** $92\,cm^2$ **c** $152\,cm^2$

## Exercise 5

**1** **a** 6700 **b** 6000 **c** 23 **d** 4900

**2** **a** $60\,cm^2$ **b** $45\,cm^2$ **c** $32\,cm^2$ **d** $30\,cm^2$

**3** **a** $19.5\,cm^2$

**4** $4125\,m^2$

**5** $106\,cm^2$

**6** $330\,cm^2$

**7** **a** $28\,cm^3$ **b** $48\,cm^3$ **c** $30\,cm^3$

**d** $342\,cm^3$ **e** $44.52\,cm^3$ **f** $84.42\,cm^3$



**8** $150\,cm^2$

**9** $600\,cm^2$

**10** **a** $3\,m^2$ **b** $30\,000\,cm^2$ **c** $225\,cm^2$
**d** 134 tiles **e** \$422.10

**11** **a** 4 cm **b** 8 cm

**12** $173\,055\,mm^3$

## Check out

**1** **a** 7000 **b** 4.5 **c** 85 000 **d** 13 000
**e** 4200

**2** $21\,cm^2$

**3** **a** $12\,cm^3$ **b** $3.375\,cm^3$

**4** **a** $188m^2$ **b** $726\,cm^2$

Homework book

## 5A

**1** **a** 500 **b** 2800 **c** 470 **d** 634

**2** **a** 7 **b** 0.9 **c** 2.74 **d** 62.73

**3** **a** 20 **b** 2000

**4** **a** 20 000 **b** 80 000 **c** 58 000 **d** 4000

**5** **a** 4 000 000 **b** 7 000 000 **c** 3 900 000 **d** 6000

**6** **a** 36 **b** 35 000 **c** 8 000 000 000

**7** **a** 90 000 **b** 71

**c** 77 000 000 000 **d** 0.5

**8** **a** 7 **b** 52 **c** 0.5 **d** 0.03

**9** 50 hectares

## 5B–5C

**1** **a** 3 $cm^2$ **b** 4 $cm^2$ **c** 7.5 $cm^2$ **d** 6 $cm^2$

**e** 4 $cm^2$ **f** 7.5 $cm^2$

**2** **a** 10.5 $cm^2$ **b** 36 $cm^2$ **c** 30 $cm^2$ **d** 50 $cm^2$

**3** 7

**4** 80 $cm^2$

**5** 27 $cm^2$

**6** 18 $cm^2$

**7** 15 $cm^2$

## 5D–5E

**1** **a** 7 $cm^3$ **b** 32 $cm^3$

**2** **a** 120 $cm^3$ **b** 144 $cm^3$ **c** 140 $cm^3$ **d** 480 $cm^3$
**e** 100 $cm^3$ **f** 99 $cm^3$

**3** **a** 400 000 $cm^3$ **b** 0.4 $m^3$

**4** 9

**5** **a** 6 $m^3$ **b** 6 000 000 $cm^3$

**6** 540 $cm^3$

**7** **a** 6.5 cm **b** 18 cm

**8** 180 $cm^3$

**9** 11

## 5F

**1** **a** 96 $cm^2$ **b** 384 $cm^2$
**c** The surface area quadruples (i.e. × 4).

**2** **a** 110 $cm^2$ **b** 108 $cm^2$
**c** 304 $cm^2$ **d** 128 $cm^2$
**e** 196 $cm^2$ **f** 94 $cm^2$



**3** 13 cm