

29

Number, n.	Rounded correct to...	Bounds
440	nearest 10	$435 \leq n < 445$
6200	nearest 100	$6150 \leq n < 6250$
42 000	nearest 1000	$41 500 \leq n < 42 500$
756 200	nearest 100	$756 150 \leq n < 756 250$

30 a $\frac{7w}{12}$ b $\frac{29e}{35}$ c $\frac{2}{3c}$ d $\frac{7}{4d}$

e $\frac{7x}{4}$ f $\frac{5h+4}{h}$

31 a ± 5.5 b 6.7 c ± 2.2 d 10.7

e -7.9 f 13.2

32 a $\frac{4x+1}{3}$ b $\frac{x+5y-3z}{2}$ c $\frac{2x+7y}{2}$ d $\frac{1}{9-3m}$

e $\frac{12-4t}{9}$

33 a 4.1 b 1.7 c 3.1 d 5.4

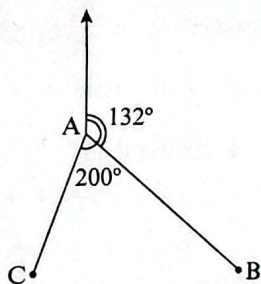
e -2.3 f -7.9

34 a For example, he could go to different places in the school rather than just outside the sports hall and he could ask more people. He could change the time he asks people. His sample is biased because of where he is, people coming out of the sports hall at lunchtime might be likely to enjoy sports as they could be coming out of a lunchtime sports club.

b For example, Mike might want the teachers to put on a tennis club in his school so he might want them to think there are more students than there are who enjoy tennis.

35 a $(x+5)(x+8) - x(x+6)$ b $7x+40$

36



37 a $\frac{3k+dgh}{ghk}$ b $\frac{4a^2b+15c^2}{12a}$

38 a 1.84×10^{12} b 3.2×10^{-5}

39 Ask the first 50 customers who come out of the cinema looking happy. Ask leading/biased questions such as, 'Do you agree we are the friendliest local cinema?', 'Why would you recommend us to a friend?'

Chapter 6

Check In

1 a 225 cm² b 216 m² c 135 m²
d 35 mm² e 56 cm²

2 a circumference c halve it
b double it

Exercise 6A

1 a i 19.6 cm² ii 15.7 cm
b i 28.3 cm² ii 18.8 cm
c i 0.126 m² ii 1.26 m
d i 38.5 cm² ii 22.0 cm

2 a 23.6 cm, 88.4 cm² b 9.42 cm, 28.3 cm²
c 37.7 cm, 150.8 cm²

3 622 cm²

4 3.78 m

5 a $A = 89.3 \text{ cm}^2, P = 35.7 \text{ cm}$

b $A = 25.6 \text{ cm}^2, P = 18.8 \text{ cm}$

c $A = 64.3 \text{ cm}^2, P = 33.4 \text{ cm}$

d $A = 9.14 \text{ cm}^2, P = 12.3 \text{ cm}$

6 17.8 mm

7 2001 (to the nearest whole number of revolutions)

8 38.5 cm²

9 a 10.7 cm² b 186 cm² c 28.3 cm² d 56.5 cm²

10 Area = 9426 m², therefore 2356.5 kg of seed

11 a 3.46 m² b i 2 ii \$18.33

12 a 1.26 cm, 2.51 cm² b 15.3 cm, 53.5 cm²

c 49.5 cm, 223 cm²

Exercise 6B

1 a 9 cm², 16 cm²

b 25 cm²

c $9 + 16 = 25$

2 a 1 square, 9 squares

b 10 squares

c $1 + 9 = 10$

3 d The area of the larger square is equal to the sum of the areas of the two smaller squares.

5 a 20 mm b 50 mm c 13 mm d 29 mm

e 37 mm

6

	a	b	c	a ²	b ²	a ² + b ²	c ²
a	12	16	20	144	256	400	400
b	30	40	50	900	1600	2500	2500
c	5	12	13	25	144	169	169
d	20	21	29	400	441	841	841
e	12	35	37	144	1225	1369	1369

The numbers in the last two columns are the same.

Exercise 6C

1 $h^2 = 7^2 + 24^2, h^2 = 49 + 576, h^2 = 625, h = \sqrt{625} = 25$

2 a 13 cm b 17 cm c 26 cm d 20 cm

3 a 3.61 cm b 9.43 cm c 5.66 cm d 6.08 cm

4 $a^2 + 4^2 = 5^2, a^2 + 16 = 25, a^2 = 9, a = \sqrt{9}, \text{ so } a = 3$

5 a 8 cm b 6 cm c 9 cm d 16 cm

6 a 7.81 cm b 8.94 cm c 9.54 cm d 10.30 cm

7 a i 7.07 cm ii 4.24 cm b i 8.06 cm ii 9.22 cm

8 24.5 cm

9 12 cm

10 6 cm and 11.4 cm

11 26 and 16.6 cm

12 39.4 cm

13 a 54 cm² b 420 mm²

14 $29^2 = 20^2 + 21^2$ and $41^2 = 40^2 + 9^2$, so A and C are right-angled.

$18^2 \neq 15^2 + 9^2$ so B is not right-angled.

15 20 units

Exercise 6D

1 a 92 cm² b 870 mm²

2 a 480 cm² b 246 m²

3 a i 314 cm² ii 113 cm² iii 565 cm²

b i 471 cm² ii 170 cm² iii 919 cm²

4 The cylinder with the smallest surface area is A (641 cm²)
The cylinder with the largest surface area is B (858 cm²)
The two cylinders with the same surface area are C and D (855 cm²)

- 5 Yes, the surface area is 2070 cm^2
- 6 a 240 cm^2 b 22.56 m^2
- 7 Students' answers will vary.
- 8 a 12.3 m^2 b 1.1 litres
- 9 a Doubling the length only doubles the area of the rectangles, the areas of the triangular faces will be unchanged.
b 1560 cm^2
- 10 Area of triangular faces is $\frac{1}{2} \times 3 \times 4 \times 2 = 12 \text{ cm}^2$
Hypotenuse in triangle is 5 cm from Pythagoras ($3^2 + 4^2 = 5^2$)
Area of rectangular faces is $3x + 4x + 5x = 12x$
Total surface area = $12x + 12 = 12(x + 1)$ and since x is an integer then $x + 1$ is an integer so it is a multiple of 12.

Exercise 6E

- 1 a 1130 cm^3 b 176 cm^3
- 2 a 26 cm^2 b 78 cm^3
- 3 a 416 cm^3 b 432 cm^3 c 259 cm^3
- 4 a i 181.0 cm^3 ii 128.7 cm^3
b i 12 cm ii 6 cm
- 5 a 172.8 cm^3 b 202.5 cm^3 c 154 m^3
- 6 a $311\,018 \text{ cm}^3$ b 311 litres c 426
- 7 a 200 cm^3 b 202.5 cm^3
- 8 12 cm
- 9 8 cm
- 10 a 88 cm^2 b $17\,600 \text{ cm}^3$
- 11 a 628 cm^3 b 72 cm^3 c 556 cm^3
- 12 a 28.3 cm^2 b 226 cm^3

Exercise 6F

- 1 a light years b tonnes
c micrometres d micrograms
e megametres f nanograms
g terabytes h microlitres
i gigabytes
- 2 a true b false, $500\,000 \mu\text{m} = 0.5 \text{ m}$
c true d true
e false, $0.000\,04 \text{ t} = 40\,000\,000 \mu\text{g}$
f false, $2 \text{ GB} = 2000 \text{ MB}$
- 3 a i 2 MB ii 2 TB b i 0.7 ng ii 0.7 t
c i $3 \mu\text{m}$ ii 3 ly
- 4 a 38 b 5000
c heavyweight paper and thick card d 3
- 5 250
- 6 a Yes, he eats $7.2 + 19.5 + 64 = 90.7 \text{ mg}$ of vitamin C.
b No, she eats $64 + 3.5 + 2.9 = 70.4 \text{ mg}$ of vitamin C.
- 7 a $6 \times 10^{12} \text{ g}$ b $6 \times 10^9 \text{ kg}$
c $6 \times 10^6 \text{ t}$ d 6 Mt
- 8 a 6 g b $300 \mu\text{g}$
- 9 a 500 t b 2 Mt

Consolidation

Exercise 6

- 1 a i 25.1 cm ii 50.3 cm^2
b i 18.8 cm ii 28.3 cm^2
- 2 a 20 cm b 39 cm c 8.06 cm (2 d.p.)
d 20 cm e 13.86 cm (2 d.p.) f 8.66 cm (2 d.p.)
- 3 a 56.5 cm^2 b 11.8 cm^2

- 5 3.61 m
- 6 6.71 m
- 7 7.75 m, i.e. 1.04 m higher
- 8 6.93 m
- 9 a i 136 m ii 1204 m^2
b i 190 cm ii 438 cm^2
c i 26.5 cm ii 39.4 cm^2
- 10 a 252 cm^3 b 308.4 cm^2
- 11 a 700 b 0.3 c 0.07 d 0.4
- 12 134 mm^2
- 13 a 6.28 cm^3 b 1539 cm^3 c 942 mm^3 d 0.0707 m^3
- 14 35.75 m^3
- 15 a 63.6 m^2 b 113 m^2 c 49.5 m^2
- 16 a i 0.3 ng ii 0.3 t
b i 0.05 GB ii 5000 MB
c i 0.000 05 mm ii 0.005 ly
- 17 a 176.4 cm^3 b 3695 cm^3
- 18 a 132 cm b 1500
- 19 17.5 cm
- 20 a 517.5 m^3 b 432.5 m^2
- 21 125
- 22 a $r = 1, h = 0.2$ b 62.8 cm^3
- 23 20
- 24 a 68.2 cm^2 b 2047 cm^3
- 25 a 2 m b 4 s
- 26 a $86\,394 \text{ cm}^3$ b 0.0864 m^3

Check out

- 1 a 63.6 cm^2 b 26.4 cm^2
- 2 a 5 b 11.3 (1 d.p.) c 28.9 (1 d.p.)
- 3 b is a prism
- 4 972 m^3
- 5 1176 cm^2
- 6 603 cm^2
- 7 a $34\,000 \text{ ns} = 34 \mu\text{s}$
b $4 \text{ GB} = 4000 \text{ MB}$
c $70 \text{ mg} = 70\,000 \mu\text{g}$
d $800\,000\,000 \text{ km} = 800 \text{ Gm}$

Chapter 7

Check in

- 1 a $\frac{7}{20}$ b $\frac{3}{8}$ c $\frac{13}{63}$ d $\frac{11}{56}$
e $\frac{1}{4}$ f $\frac{1}{4}$
- 2 a $5\frac{7}{12}$ b $2\frac{1}{4}$ c $9\frac{5}{12}$ d $2\frac{11}{35}$
- 3 a 16 b 27 c 16

Exercise 7A

- 1 a 1, 3, 5, 15 b 1, 2, 3, 4, 6, 8, 12, 24
c 1, 2, 3, 5, 6, 10, 15, 30 d 1, 5, 25
- 2 Factors of 60 are 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60
Factors of 84 are 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84
HCF of 60 and 84 is therefore 12