

# Answers Busy at Maths 6

## PAGE 1

- 1.**  
(a) 24,368  
(b) 42,605  
(c) 57,032  
(d) 70,059
- 2.** No answers needed
- 3.**  
(a) 8,000  
(b) 30,000  
(c) 60  
(d) 1,000  
(e) 9  
(f) 40,000  
(g) 4,000  
(h) 7  
(i) 300  
(j) 600
- 4.**  
(a) a – c;  
b – f;  
c – e;  
d – a;  
e – b;  
f – d
- 5.**  
(a) 530; 500; 1,000  
(b) 1,320; 1,300; 1,000  
(c) 4,370; 4,400; 4,000  
(d) 5,890; 5,900; 6,000  
(e) 12,090; 12,100; 12,000  
(f) 37,850; 37,800; 38,000  
(g) 42,950; 43,000; 43,000  
(h) 86,700; 86,700; 87,000

- 6.**  
98,763 – 36,789  
86,541 – 14,568  
98,732 – 23,789  
87,651 – 15,678

- 7.**  
(a) 917,000  
(b) 34,607

## PAGE 2

- 1.**  
(a) rhombus  
(b) octagon  
(c) trapezium

- (d) hexagon  
(e) parallelogram  
(f) pentagon

- 2.**  
(a) 68,728  
(b) 24,534  
(c) 56,985  
(d) 42,136  
(e) 67,838

- 3.**  
(a) 52,133  
(b) 88,579  
(c) 51,612  
(d) 82,627  
(e) 54,656

- 4.**  
(a) 78,989  
(b) 98,007  
(c) 77,165  
(d) 89,788  
(e) 87,795

- 5.**  
(a) tetrahedron  
(b) cylinder  
(c) octahedron  
(d) cone  
(e) triangular prism  
(f) square pyramid

- 6.**  
(a) €3.75  
(b) €5.66  
(c) €7.04

**Challenge 1:** 51,303

**Challenge 2:** 26,288

## PAGE 3

- 1.**  
(a) 70  
(b) 180  
(c) 790  
(d) 900  
(e) 2,400  
(f) 36,000  
(g) 89,000  
(h) 154  
(i) 428  
(j) 985

- 2.**  
(a) 4  
(b) 8  
(c) 8  
(d) 8  
(e) 8  
(f) 9  
(g) 3.86  
(h) 24  
(i) 3.7  
(j) 7.8

- 3.**  
(a) €42.81  
(b) €98.72  
(c) €192.95  
(d) €404.58  
(e) €410.69  
(f) 7,848  
(g) 8,188  
(h) 12,667  
(i) 29,279  
(j) 25,276

- 4.**  
(a) 127  
(b) 142  
(c) 98  
(d) 118  
(e) 116

- 5.**  
(a) 27  
(b) 32  
(c) 19  
(d) 17  
(e) 13

**Challenge 1:** 1,450

**Challenge 2:** 34

- 6.**  
(a) 7.35am  
(b) 2.16pm  
(c) 8.46pm  
(d) 4.29am  
(e) 11.38pm

- 7.**  
(a) 14:15  
(b) 06:55  
(c) 19:45

- (d) 12:25  
(e) 00:35  
(f) 22:04
- 8.**  
(a) 3hr 10mins  
(b) 2hr 15mins  
(c) 2hr 29mins  
(d) 3hr 17mins  
(e) 3hr 32mins  
(f) 2hr 36min

- 9.**  
(a) 4hr 40mins  
(b) 3hr 16mins  
(c) 9hr 39mins  
(d) 2hr 34mins  
(e) 8hr 27mins

**Challenge:** 2hr 3mins

## PAGE 4

- 1.**  
(a) acute  
(b) obtuse  
(c) straight  
(d) reflex  
(e) right

- 2.**  
(a) 80°  
(b) 70°  
(c) 55°  
(d) 120°

- 3.**  
(a)  $\frac{2}{4}, \frac{4}{8}$   
(b)  $\frac{2}{8}, \frac{3}{12}$   
(c)  $\frac{2}{10}, \frac{3}{15}$   
(d)  $\frac{2}{12}, \frac{4}{24}$   
(e)  $\frac{9}{12}, \frac{15}{20}$   
(f)  $\frac{9}{15}, \frac{18}{30}$   
(g)  $\frac{10}{16}, \frac{15}{24}$   
(h)  $\frac{10}{12}, \frac{25}{30}$

- 4.**  
(a) 9  
(b) 10  
(c) 12  
(d) 21  
(e) 20

5.

- (a) 5; 15
- (b) 6; 30
- (c) 5; 40
- (d) 5; 50
- (e) 8; 96

6.

- (a)  $5\frac{5}{6}$
- (b)  $3\frac{1}{4}$
- (c)  $5\frac{7}{10}$
- (d)  $2\frac{4}{10}$  or  $2\frac{2}{5}$
- (e)  $5\frac{7}{9}$
- (f)  $4\frac{2}{9}$

Challenge:  $71^\circ$

## PAGE 5

1.

- (a) 0.7
- (b) 0.16
- (c) 0.98
- (d) 0.374
- (e) 0.958
- (f) 0.03
- (g) 0.017
- (h) 0.306
- (i) 0.1
- (j) 0.004

2.

- (a) 10.42
- (b) 11.46
- (c) 5.04
- (d) 6.79
- (e) 9.21
- (f) 4.528

3.

- (a) 2cm 4mm
- (b) 3cm 8mm
- (c) 4cm 7mm

4.

- (a)  $\frac{43}{100}m = 0.43m$
- (b)  $\frac{72}{100}m = 0.72m$
- (c)  $\frac{3}{100}m = 0.03m$
- (d)  $1\frac{15}{100}m = 1.15m$
- (e)  $2\frac{95}{100}m = 2.95m$

5.

- (a) 2,136m
- (b) 5,065m
- (c) 3,004cm
- (d) 340m
- (e) 2,063m
- (f) 4,300m

6.

- (a) 0.156kg
- (b) 2.348kg
- (c) 7.053kg
- (d) 3,793g
- (e) 5,086g
- (f) 3,005g

7.

- (a) 6.224l
- (b) 5.282l
- (c) 8.023l
- (d) 3.446l
- (e) 9.305l

8.

- (a) 33.606l
- (b) 63.42kg
- (c) 1.613km
- (d) 1.076l

9.

- (a) 48
- (b) 56
- (c) 19
- (d) 24
- (e) 26
- (f) 42

10.

- (a) = (b) > (c) >

11.

- (a)  $\frac{1}{10}$
- (b)  $\frac{1}{5}$
- (c)  $\frac{1}{4}$
- (d)  $\frac{3}{10}$
- (e)  $\frac{1}{2}$
- (f)  $\frac{3}{20}$
- (g)  $\frac{9}{20}$
- (h)  $\frac{13}{20}$
- (i)  $\frac{3}{4}$
- (j)  $\frac{17}{20}$

Challenge: 9.05kg

## PAGE 6

- 1. 48,384
- 2. €30
- 3. €10
- 4. 25,400
- 5. €7
- 6. 7.08m
- 7. 34cm
- 8.  $\frac{2}{3}$
- 9.  $\frac{6}{16}$
- 10.  $2\frac{1}{2}$
- 11. 3
- 12. 7
- 13. Acute
- 14. Cian €5
- 15. €12
- 16. 74%
- 17. 3
- 18. 9
- 19. 1 in 2
- 20. 5.2

## PAGE 7

- 1.
- (a) 359,024
- (b) 264,708
- (c) 509,540

2. No answers

3. No answers

4.

- (a) €354,546
- (b) €520,365
- (c) €802,476
- (d) €600,803
- (e) €700,077

5.

- (a) 346,253
- (b) 612,527
- (c) 916,000
- (d) 800,003
- (e) 101,001
- (f) 407,000
- (g) 275,008
- (h) 516,000
- (i) 701,000
- (j) 718,000
- (k) 999,099
- (l) 990,000

## PAGE 8

1.

- (a) No answers
- (b) (i) €246,003    €267,203
- (ii) €319,249    €320,249
- €329,249    €331,249
- €340,249    €340,449
- (iii) €213,877    €214,877
- €223,877    €225,877
- €234,877    €235,077
- (iv) €374,505    €375,505
- €384,505    €386,505
- €395,505    €395,705
- (v) €364,224    €365,224
- €374,224    €376,224
- €385,224    €385,424
- (vi) €278,128    €279,128
- €288,128    €290,128
- €299,128    €299,328

2.

- (a) No answers
- (b) 40,000; 600,000; 600; 2,000; 4; 30
- (c) Ballyville, River Valley; Laketown; Tumbleton; Seaville; Hillcrest

3.

- (a) – (b);
- (b) – (d);
- (c) – (a);
- (d) – (c);
- (e) – (e)

## PAGE 9

1.

- (a) €200,000
- (b) €500,000
- (c) €800,000
- (d) €800

2.

- (a) 500
- (b) 70,000
- (c) 6,000,000
- (d) 900
- (e) 90,000 and 50
- (f) 400,000 and 400
- (g) 300,000; 7,000; 8
- (h) 900,000; 9,000; 9

3.  
 (a) No answers  
 (b) 1,904,603; €2,643,817;  
 €3,612,546; €4,963,110;  
 €5,629,310; €8,100,623;  
 €9,612,548  
 (c) No answers

4.  
 (a) 3,425,827  
 (b) 7,053,000  
 (c) 6,000,017  
 (d) 9,017,000  
 (e) 4,208,000  
 (f) 8,808,088

**PAGE 10**

1.  
 (a) VIII; X  
 (b) XII; XIII; XV; XVI; XVII;  
 XVIII; XIX  
 (c) XXI; XXIV; XXV; XXIX;  
 XXX; L; LXX; LXXX  
 (d) XCI; XCIV; XCV; XCVIII;  
 XCIX; C; CI; CXC  
 (e) CXCIX; CCC; CD; D; DCC;  
 DCCC; CM

2.  
 (a) 2,000  
 (b) 2,005  
 (c) 2,019  
 (d) 2,006  
 (e) 1,943  
 (f) 1,922  
 (g) 1,959  
 (h) 1,984

**PAGE 11**

1.  
 (a) 3,648  
 (b) 6,957  
 (c) 6,747  
 (d) 7,734  
 (e) 6,868  
 (f) 5,878  
 (g) 3,878  
 (h) 5,787

2.  
 (a) 5,883  
 (b) 7,797  
 (c) 4,976

- (d) 6,879  
 (e) 7,797  
 (f) 5,447  
 (g) 7,838  
 (h) 7,779  
 (i) 7,789  
 (j) 9,489  
 (k) 7,877  
 (l) 9,769

3.  
 (a) 4,352  
 (b) 2,235  
 (c) 2,234  
 (d) 5,253  
 (e) 3,322  
 (f) 5,442  
 (g) 5,533  
 (h) 4,542

4.  
 (a) 1,121  
 (b) 2,413  
 (c) 2,464  
 (d) 2,513  
 (e) 2,464  
 (f) 3,041  
 (g) 4,321  
 (h) 3,333

**PAGE 12**

1.  
 (a) 430; 400  
 (b) 590; 600; 1,000  
 (c) 5,870; 5,900; 6,000;  
 10,000  
 (d) 8,740; 8,700; 9,000;  
 10,000  
 (e) 23,890; 23,900; 24,000;  
 20,000  
 (f) 48,970; 49,000; 49,000;  
 50,000  
 (g) 378,290; 378,300;  
 378,000; 380,000  
 (h) 783,930; 783,900;  
 784,000; 780,000

2.  
 (i) (a) €76,320; €76,300;  
 €76,000; €80,000  
 (b) €87,600; €87,600;  
 €88,000; €90,000

- (c) €81,650; €81,600  
 €82,000; €80,000  
 (d) €278,440; €278,400  
 €278,000; €280,000  
 (e) €714,820; €714,800  
 €715,000; €710,000  
 (f) €239,870; €239,900  
 €240,000; €240,000  
 (ii) €714,821; €278,439;  
 €239,873; €87,598;  
 €81,647; €76,324  
 (iii) €70,000; €7,000;  
 €7; €70,000;  
 €700,000; €70  
 (iv) €239,873

**PAGE 13**

1.  
 (a) 90  
 (b) 800  
 (c) 12,000  
 (d) 8,000  
 (e) 50  
 (f) 100  
 (g) 3,000  
 (h) 6,000  
 (i) 120  
 (j) 2,800  
 (k) 24,000  
 (l) 30,000  
 (m) 20  
 (n) 20  
 (o) 40  
 (p) 30

2.  
 (i) (a) 31km  
 (b) 33l  
 (c) €21  
 (d) 27kg  
 (ii) (a) 32.825km  
 (b) 34.891l  
 (c) €23.38  
 (d) 29.613kg

- Challenge: (i) 5,000  
 (ii) 3,000

**PAGE 14**

No answers

**PAGE 15**

1.  
 (a) 879,899  
 (b) 975,556  
 (c) 895,181  
 (d) 768,214

2.  
 (a) 873,654  
 (b) 760,405  
 (c) 874,290  
 (d) 715,122

3.  
 (a) €829,007  
 (b) €762,178  
 (c) B and E  
 (d) A, C and E  
 (e) €11,538  
 (f) €147,987

**PAGE 16**

1.  
 (a) 166,678  
 (b) 187,827  
 (c) 465,221  
 (d) 243,156

2.  
 (a) 155,848  
 (b) 337,864  
 (c) 240,432  
 (d) 188,718

3.  
 (a) 118,001  
 (b) 766,682  
 (c) Cyprus and Montenegro  
 (d) 106,983  
 (e) Latvia, Albania, Slovenia,  
 Cyprus, Montenegro,  
 Bermuda  
 (f) 777,700

Challenge: 723,409

**PAGE 17**

1.  
 (a) 35,618  
 (b) 130,252  
 (c) 131,955  
 (d) 300,183  
 (e) 222,582

2.  
 (a) 598,211  
 (b) 940,079  
 (c) 867,514  
 Challenge: 531,995

## PAGE 18

1. Sports  
 2. Books  
 3. 43,826; 91,003; 394,102;  
 438,791; 573,291; 600,000  
 4. 573,000; 439,000; 394,000;  
 600,000; 91,000; 44,000  
 5. 832,893  
 6. 708,120  
 7. 44,689  
 8. 162,072  
 9. 161,209  
 10. 134,500  
 11. 508,997  
 12. 168,599  
 13. 876,719  
 14. 707,976; 670,470; 439,491;  
 847,819; 764,293; 168,802  
 15. 326,709; 461,209;  
 505,898; 300,000;  
 808,997; 856,174

## PAGE 19

1.  
 (a) (i) Oisín  
 (ii) Sean  
 (b) Molly and Sean  
 (c) 1  
 2.  
 (a) 28kg  
 (b) 368g  
 (c) 4,632kg  
 3.  
 (a) 81%  
 (b) 71%  
 (c) 95%  
 4.  
 (a) (i) Niamh  
 (ii) Clare

- (b) 12mins  
 (c) 30mins  
 (d) Mam  
 Challenge: €466.20

## PAGE 20

1.  
 (a) (i) Ryan  
 (ii) Lisa  
 (iii) Lisa  
 (iv) Ryan  
 (v) Lisa  
 (vi) Ryan  
 (b) 146cm  
 (c) 59kg  
 (d) 33kg  
 (e) 21  
 (f) no answer  
 2. No answers  
 3.  
 (a) (i) 72  
 (ii) 368  
 (iii) 40  
 (iv) 176  
 (v) 432  
 (b) (i) 9  
 (ii) 46  
 (iii) 5  
 (iv) 22  
 (v) 54

Challenge: Ciara 15  
 Billy 6

## PAGE 21

1.  
 (a) 24  
 (b) 266  
 (c) €20  
 2.  
 (a) 5  
 (b) 26  
 (c) 9.1  
 (d) 16.9  
 3. 56,340km

4.  
 (a) 195secs  
 (b) 13min 32secs

5. 6

6.  
 (a) 82mins; 93mins; 104mins  
 (b) 93mins

Challenge: 1hr 31mins

## PAGE 22

1. No answers  
 2.  
 (a) 300  
 (b) 2,100  
 (c) 240  
 (d) 720  
 (e) 540  
 (f) 4,500  
 (g) 720  
 (h) 1,260  
 (i) 1,800  
 (j) 4,500  
 (k) 4,800  
 (l) 4,500

3.  
 (a) 280km  
 (b) 2,800km

4. 180hrs

5.  
 (a) 340  
 (b) 34,000

Challenge: 11

## PAGE 23

1.  
 (a) 74.58  
 (b) 745.8  
 (c) 7,458  
 2.  
 (a) 182.93  
 (b) 1,829.3  
 (c) 18,293

3.  
 (a) 65.02  
 (b) 650.2  
 (c) 6,502

4.  
 (a) 304.7  
 (b) 3,047  
 (c) 30,470

5.  
 (a) 6,832  
 (b) 9,176  
 (c) 2,877  
 (d) 5,378

6.  
 (a) 14,520  
 (b) 73,360  
 (c) 80,450  
 (d) 91,060

7.  
 (a) 316,900  
 (b) 550,800  
 (c) 40,400  
 (d) 274

8.  
 (a) €35.34  
 (b) €123.69  
 (c) €159.03

9.  
 (a) €740  
 (b) €4,440  
 (c) €6,660  
 (d) €8,880  
 (e) €13,320

10.  
 (a) 562  
 (b) 3,750  
 (c) 64,080

11.  
 (a) 156  
 (b) 1,560  
 (c) 15,600  
 (d) 31,200  
 (e) 3,120  
 (f) 312

**Challenge:** (a) 520,000km<sup>2</sup>  
(b) 5,200,000km<sup>2</sup>

**PAGE 24**

- 1.**  
(a) 600; 80;  
210; 28; = 918  
(b) 1200; 180;  
200; 30; = 1610  
(c) 2800; 80;  
420; 12; = 3312  
(d) 2400; 150;  
720; 45; = 3315
- 2.**  
(a) 9000; 1500; 120;  
1800; 300; 24; = 12,744  
(b) 8000; 2800; 40 x 20  
2800; 490; 14 x 7; = 12,744  
(c) 21000; 1400; 420 x 76;  
1500; 100; 30 x 5; = 24,450
- 3.** 11,868
- 4.**  
(a) 19,082  
(b) 17,766

**Challenge:** 33,500

**PAGE 25**

- 1.**  
(a) 67  
(b) 42  
(c) 83  
(d) 91
- 2.**  
(a) 24·1  
(b) 76·5  
(c) 20·8  
(d) 55·2
- 3.**  
(a) 439  
(b) 923  
(c) 352  
(d) 704
- 4.**  
(a) 2,620  
(b) 5,370  
(c) 7,080  
(d) 8,250
- 5.**  
(a) 153  
(b) 1,530  
(c) 153  
(d) 15·3
- 6.**  
(a) 59  
(b) 59  
(c) 50·9  
(d) 509
- 7.**  
(a) 25,542  
(b) 28,372  
(c) 8,877  
(d) 35,412
- 8.**  
(a) 21,842  
(b) 14,532  
(c) 29,115  
(d) 62,436
- 9.**  
(a) 25,818  
(b) 17,784  
(c) 14,168  
(d) 35,890
- 10.**  
(a) 58·1  
(b) 388·6  
(c) 2,487·88
- 11.**  
(a) 55·8  
(b) 576·2  
(c) 2,319·29
- 12.**  
(a) 309·6  
(b) 460·6  
(c) 5,182·32
- 13.**  
(a) 331·8  
(b) 1,228·5  
(c) 2,936·56
- Challenge:** 11

**PAGE 26**

- 1.**  
(a) 499·466  
(b) 560·192  
(c) 346·144  
(d) 434·938
- 2.**  
(a) 113·763  
(b) 370·359  
(c) 239·659  
(d) 484·716
- 3.**  
(a) 614·384  
(b) 159·768  
(c) 4,102·28  
(d) 1,623·38
- 4.**  
(a) 2,207·36  
(b) 10,160·2  
(c) 51,694·2  
(d) 35,757·6
- 5.**  
(a) 129·237  
(b) 2,487·04  
(c) 51,567·3  
(d) 560·697
- 6.**  
(a) 358·61  
(b) 1,658·16

- 7.**  
(a) 166·535km  
(b) 339·72km
- 8.**  
(a) €1101·87  
(b) €1,224·30
- 9.** 1,049·88km
- 10.**  
(a) 141·525km  
(b) 9·86km  
(c) 460·105km

**Challenge:** 87·36m

**PAGE 27**

- 1.** 879·747  
**2.** 1,307·96  
**3.** 838·642  
**4.** 1,783·21  
**5.** 15,994·2  
**6.** 23,544·5  
**7.** 5,070·72  
**8.** 7,797·24  
**9.** 47,790  
**10.** 69,880
- 11.**  
(a) 4,739·55kg  
(b) 5,654·2kg  
(c) 8,315kg
- 12.** €850·64
- 13.**  
(a) €227·50  
(b) €323·75
- 14.**  
(a) €11,591·94  
(b) €12,535·47  
(c) €13,344·21
- 15.** €9,965·48  
**16.** €1,182  
**17.** €1,957·76

**Challenge:** 92·829m

**PAGE 28**

- 1.** 4,000  
**2.** 900,000  
**3.** 497,156  
**4.** 3,764,195  
**5.** €800  
**6.** 1,978  
**7.** 837,000  
**8.** €198,286  
**9.** 8  
**10.** €59,991  
**11.** 15  
**12.** 124cm  
**13.** 13  
**14.** 2,400  
**15.** 360  
**16.** 5,700  
**17.** €3,740

18. 12,000  
19. 96,584km  
20. 11,200

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## PAGE 29

1.  
(a) (i) – (iii);  
(ii) – (iv);  
(iii) – (ii);  
(iv) – (i)

- (b) (i) – (iv);  
(ii) – (iii);  
(iii) – (ii);  
(iv) – (i)

2. No answers

3.  
(a) 4  
(b) 40  
(c) 40  
(d) 3  
(e) 30  
(f) 30  
(g) 6  
(h) 60  
(i) 60

4.  
(a) 42  
(b) 48  
(c) 7  
(d) 7  
(e) 6  
(f) 6  
(g) 6  
(h) 3  
(i) 3  
(j) 8  
(k) 9  
(l) 99

Challenge: 4·84kg

---

## PAGE 30

1.  
(a) 42·9  
(b) 6·43  
(c) 2·75  
(d) 0·275

2.  
(a) 0·916  
(b) 1·52  
(c) 3·784  
(d) 0·6

3.  
(a) 0·7  
(b) 0·037  
(c) 0·0422  
(d) 0·6213

4.  
(a) 0·304  
(b) 0·008  
(c) 0·87  
(d) 0·054

5.  
(a) 0·62m  
(b) 0·0527km  
(c) 0·09kg  
(d) 0·73l

6. 12  
7. 27·39

8.  
(a) 4,220m  
(b) 422m
9.  
(a) €0·74  
(b) €74  
(c) €7·40  
(d) €518  
(e) €44·40

Challenge: (a) 180km  
(b) 18km  
(c) 1·8km

---

## PAGE 31

1.  
(a) 20  
(b) 30  
(c) 24  
(d) 53

2.  
(a) 45  
(b) 33  
(c) 18  
(d) 17

3. 30  
4. 18  
5. 16  
6. 11  
7. 15

8.  
(a) (i) 161 (ii) 80·5  
(b) (i) 6·44 (ii) 3·22  
(c) (i) 2·75 (ii) 1·375  
(d) (i) 25·1 (ii) 12·55  
(e) (i) 17·54 (ii) 8·77  
(f) (i) 65·1 (ii) 32·55  
(g) (i) 275·8 (ii) 137·9  
(h) (i) 21·18 (ii) 10·59  
(i) (i) 10·31 (ii) 5·155  
(j) (i) 24·14 (ii) 12·07

Challenge: (a) 8  
(b) 20

---

## PAGE 32

1.  
(a) 247  
(b) 153  
(c) 255  
(d) 436

2.  
(a) 377  
(b) 155  
(c) 281  
(d) 247

3.  
(a) 277  
(b) 376  
(c) 159  
(d) 188

4.  
(a) 407  
(b) 163  
(c) 237  
(d) 437

5.  
(a) 177  
(b) 226  
(c) 187  
(d) 567

6. €245  
7. €149  
8. €254  
9. 56  
10. €1·35  
11. €2·68

Challenge: 54

---

## PAGE 33

1.  
(a) 1·9  
(b) 3·3  
(c) 4·2  
(d) 3·6

2.  
(a) 3·6  
(b) 3·8  
(c) 1·7  
(d) 1·7

3.  
(a) 3·3  
(b) 2·9  
(c) 3·1  
(d) 2·9

4.  
(a) 6·4  
(b) 8·3  
(c) 3·3  
(d) 5·6

5.  
(a) 3·8  
(b) 2·7  
(c) 6·7  
(d) 4·7

6.  
(a) 0·43  
(b) 0·17  
(c) 0·36  
(d) 0·23

7.  
(a) 0·21  
(b) 0·17  
(c) 0·26  
(d) 0·32

- 8.**  
**(a)** €0.37  
**(b)** €0.63  
**(c)** €0.26  
**(d)** €0.39

- 9.**  
**(a)** 0.37m  
**(b)** 0.18m  
**(c)** 0.23m  
**(d)** 0.53m

- 10.**  
**(a)** €0.26  
**(b)** €0.69  
**(c)** €0.29  
**(d)** €0.29

**Challenge:** 3,000

**PAGE 34**

- 1.** 10  
**2.** 1,240  
**3.** 2,772  
**4.** €3,570  
**5.** 16:07  
**6.** 376  
**7.** 409  
**8.** €78.75  
**9.** €3.75  
**10.** €22,700  
**11.** €2,947.80  
**12.** 13  
**13.** 902

**Challenge:**

- (a)** 3,954  
**(b)** 2,714

**PAGE 35**

- 1.**  
**(a)** reflex  
**(b)** acute  
**(c)** right  
**(d)** obtuse  
**(e)** straight
- 2.**  
**(a)** (i) 75°  
(ii) outside  
**(b)** (i) 154°  
(ii) inside

- (c)** (i) 36°  
(ii) inside  
**(d)** (i) 172°  
(ii) outside  
**(e)** (i) 25°  
(ii) inside

**3.**

- (a)** 80°  
**(b)** 110°  
**(c)** 40°  
**(d)** 120°

**4.** No answers

**PAGE 36**

**1.**

- A: 70°, acute  
B: 40°, acute  
C: 70°, acute  
D: 90°, right  
E: 130°, obtuse  
F: 100°, obtuse  
G: 130°, obtuse  
H: 90°, right  
I: 120°, obtuse  
J: 90°, right  
K: 120°, obtuse  
L: 90°, right  
M: 120°, obtuse

**2.** No answers

**Challenge:** no answer

**PAGE 37**

No answers needed

**PAGE 38**

- 1.** 60°
- 2.**  
**(a)** 50°, acute  
**(b)** 55°, acute  
**(c)** 35°, acute  
**(d)** 80°, acute  
**(e)** 40°, acute  
**(f)** 46°, acute  
**(g)** 70°, acute  
**(h)** 41°, acute  
**(i)** 40°, acute  
**(j)** 54°, acute

**3.**

- (a)** (i) triangle  
(ii) triangle  
**(b)** rectangle  
**(c)** 180°  
**(d)** 180°  
**(e)** 360°

**4.**

- (a)** 115°, obtuse  
**(b)** 75°, acute  
**(c)** 105°, obtuse  
**(d)** 101°, obtuse  
**(e)** 136°, obtuse  
**(f)** 72°, acute

**PAGE 39**

**1.**

- (a)** 270°  
**(b)** 180°  
**(c)** 360°  
**(d)** 720°  
**(e)** 90°  
**(f)** 450°

**2.**

- (a)** (i) 360°  
(ii) 90°  
(iii) 270°  
(iv) 180°  
(v) 390°  
(vi) 6°  
(vii) 30°  
(viii) 120°

- (b)** (i) 150°  
(ii) 90°  
(iii) 60°  
(iv) 210°  
(v) 270°  
(vi) 174°  
(vii) 210°  
(viii) 300°  
(ix) 420°

**3.**

- (a)** anti-clockwise
- (b)** (i) yellow  
(ii) blue  
(iii) pink  
(iv) green  
(v) red  
(vi) orange  
(vii) red  
(viii) yellow  
(ix) green

- (x) yellow  
(xi) blue  
(xii) purple

- (c)** (i) 90°  
(ii) 135°  
(iii) 315°  
(iv) 180°

- (d)** (i) green  
(ii) yellow  
(iii) pink  
(iv) red  
(v) purple  
(vi) white  
(vii) blue  
(viii) orange  
(ix) purple  
(x) yellow

**PAGE 40**

**1.**

- (a)** 61°  
**(b)** 12°  
**(c)** 92°  
**(d)** 84°  
**(e)** 59°  
**(f)** 65°  
**(g)** 203°  
**(h)** 19°  
**(i)** 123°  
**(j)** 70°  
**(k)** 70°

**2.** No answers

**3.**

- (a)** 1315°  
**(b)** 270°  
**(c)** 325°  
**(d)** 235°

**PAGE 41**

- (a)** 10  
**(b)** 14  
**(c)** 3  
**(d)** 9  
**(e)**  $\frac{2}{5}$   
**(f)** 81

**1.**

- (a)** 5, 13  
**(b)**  $\frac{3}{4}, \frac{15}{23}, \frac{5}{53}, \frac{5}{53}, \frac{45}{100}$   
**(c)**  $1\frac{1}{2}, 2\frac{7}{9}, 1\frac{3}{10}$   
**(d)**  $\frac{6}{5}, \frac{5}{3}, \frac{18}{7}, \frac{13}{5}$

2.  
 (a) X  
 (b) ✓  
 (c) ✓  
 (d) X  
 (e) ✓  
 (f) X  
 (g) X  
 (h) X

3.  
 (a)  $\frac{4}{6}$   
 (b)  $\frac{16}{20}$   
 (c)  $\frac{4}{16}$   
 (d)  $\frac{12}{21}$   
 (e)  $\frac{15}{25}$   
 (f)  $\frac{15}{24}$

4.  
 (a)  $\frac{7}{14}$   
 (b)  $\frac{6}{9}$   
 (c)  $\frac{14}{16}$   
 (d)  $\frac{12}{15}$   
 (e)  $\frac{4}{12}$   
 (f)  $\frac{15}{20}$   
 (g)  $\frac{4}{24}$   
 (h)  $\frac{10}{25}$   
 (i)  $\frac{15}{21}$   
 (j)  $\frac{25}{40}$   
 (k)  $\frac{21}{24}$   
 (l)  $\frac{25}{45}$   
 (m)  $\frac{10}{15}$   
 (n)  $\frac{32}{40}$   
 (o)  $\frac{15}{36}$

5.  
 (a)  $\frac{1}{2} - \frac{7}{14}$ ;  
 $\frac{3}{5} - \frac{6}{10}$ ;  
 $\frac{3}{7} - \frac{9}{21}$ ;  
 $\frac{1}{5} - \frac{4}{20}$ ;  
 $\frac{8}{12} - \frac{2}{3}$ ;  
 $\frac{9}{30} - \frac{3}{10}$ ;  
 $\frac{5}{50} - \frac{1}{10}$ ;  
 $\frac{6}{18} - \frac{1}{3}$

**PAGE 42**

1.  
 (a)  $\frac{2}{6}$   
 (b)  $\frac{2}{9}$   
 (c)  $\frac{2}{3}$   
 (d)  $\frac{4}{5}$   
 (e)  $\frac{5}{6}$   
 (f)  $\frac{5}{8}$

2. No answers

**PAGE 43**

1.  
 (a)  $6 \frac{5}{12}$   
 (b)  $8 \frac{3}{10}$   
 (c)  $4 \frac{17}{20}$   
 (d)  $6 \frac{11}{21}$   
 (e)  $7 \frac{2}{9}$   
 (f)  $8 \frac{13}{28}$   
 (g)  $7 \frac{1}{36}$   
 (h)  $8 \frac{7}{30}$   
 (i)  $7 \frac{9}{20}$   
 (j)  $4 \frac{9}{40}$   
 (k)  $4 \frac{7}{24}$   
 (l)  $7 \frac{39}{56}$

2.  $4 \frac{4}{12}$ kg  
 3.  $8 \frac{17}{24}$ m

4.  
 (a)  $3 \frac{5}{12}$   
 (b)  $6 \frac{11}{12}$   
 (c)  $4 \frac{11}{16}$   
 (d)  $1 \frac{5}{6}$   
 (e)  $1 \frac{17}{18}$   
 (f)  $1 \frac{13}{20}$   
 (g)  $2 \frac{1}{24}$   
 (h)  $2 \frac{19}{22}$   
 (i)  $5 \frac{17}{20}$   
 (j)  $4 \frac{19}{28}$   
 (k)  $4 \frac{23}{40}$   
 (l)  $\frac{17}{20}$

**PAGE 44**

1.  $\frac{3}{10}$   
 2. (i) Tina  
 (ii)  $\frac{1}{12}$   
 3.  $\frac{5}{18}$   
 4.  $17 \frac{9}{10}$   
 5.  $3 \frac{29}{40}$   
 6.  $8 \frac{1}{36}$

7.  
 (a)  $\frac{1}{2}$   
 (b)  $\frac{1}{3}$   
 (c)  $\frac{3}{4}$   
 (d)  $\frac{6}{7}$   
 (e)  $\frac{2}{3}$   
 (f)  $\frac{5}{8}$

8.  
 (a)  $3 \frac{2}{3}$   
 (b)  $4 \frac{3}{4}$   
 (c)  $2 \frac{3}{5}$   
 (d)  $9 \frac{1}{4}$   
 (e)  $5 \frac{3}{8}$   
 (f)  $7 \frac{3}{4}$   
 (g)  $6 \frac{5}{6}$   
 (h)  $8 \frac{7}{9}$   
 (i)  $1 \frac{3}{4}$   
 (j)  $5 \frac{4}{9}$   
 (k)  $3 \frac{7}{10}$   
 (l)  $8 \frac{2}{3}$   
 (m)  $13 \frac{2}{9}$   
 (n)  $17 \frac{5}{6}$   
 (o)  $14 \frac{3}{4}$   
 (p)  $15 \frac{4}{9}$

9.  
 $5 \frac{3}{9} - 5 \frac{1}{3}$ ;  
 $5 \frac{25}{40} - 5 \frac{5}{8}$ ;  
 $5 \frac{3}{4} - 5 \frac{9}{12}$ ;  
 $5 \frac{2}{7} - 5 \frac{12}{42}$ ;  
 $5 \frac{9}{21} - 5 \frac{3}{7}$ ;

**PAGE 45**

1.  
 (a)  $\frac{2}{5}$   
 (b)  $\frac{4}{5}$   
 (c)  $\frac{1}{2}$   
 2.  
 (a)  $\frac{1}{10}$   
 (b)  $\frac{1}{10}$   
 (c)  $\frac{9}{100}$   
 (d)  $\frac{6}{25}$   
 (e)  $\frac{7}{20}$   
 (f)  $\frac{5}{8}$   
 (g)  $\frac{19}{100}$   
 (h)  $\frac{4}{5}$   
 3.  
 (a)  $6 \frac{3}{4}$   
 (b)  $4 \frac{4}{5}$   
 (c)  $2 \frac{1}{2}$   
 (d)  $8 \frac{5}{12}$

4.  
 (a)  $1 \frac{4}{5}$   
 (b)  $3 \frac{3}{4}$   
 (c)  $6 \frac{2}{3}$   
 (d)  $4 \frac{4}{5}$   
 (e) 9  
 (f)  $4 \frac{4}{9}$

5.  
 (a) 8  
 (b)  $5 \frac{1}{4}$   
 (c)  $4 \frac{4}{9}$   
 (d)  $6 \frac{5}{12}$   
 (e)  $10 \frac{2}{3}$   
 (f)  $7 \frac{5}{7}$   
 (g)  $5 \frac{2}{5}$   
 (h)  $4 \frac{7}{12}$   
 (i)  $5 \frac{1}{11}$

**PAGE 46**

1.  
 (a)  $\frac{2}{15}$   
 (b)  $\frac{15}{24}$   
 (c)  $\frac{2}{6}$   
 (d)  $\frac{2}{15}$   
 (e)  $\frac{1}{8}$   
 (f)  $\frac{10}{24}$   
 (g)  $\frac{9}{20}$

2.  
 (a) 4  
 (b)  $\frac{2}{5}$   
 (c) 15  
 (d)  $\frac{1}{2}$   
 (e)  $\frac{1}{3}$   
 (f)  $\frac{1}{2}$   
 (g) 7  
 (h)  $7 \frac{1}{2}$   
 (i)  $\frac{4}{9}$   
 (j)  $\frac{6}{25}$

3.  
 (a)  $\frac{1}{8}$   
 (b)  $\frac{7}{8}$   
 (c)  $\frac{3}{8}$   
 (d)  $\frac{3}{4}$   
 (e)  $\frac{1}{4}$

4.  $\frac{1}{5}$  hr  
 5. 5

6.  $\frac{3}{5} \times \frac{2}{3} = \frac{2}{5}$ ;  
 $\frac{5}{16} = \frac{3}{8} \times \frac{5}{6}$ ;  
 $\frac{4}{9} \times \frac{7}{8} = \frac{7}{18}$ ;  
 $\frac{1}{2} = \frac{6}{15} \times \frac{5}{4}$

Challenge: 6 hrs



**PAGE 47**

1. 5,467
2. €264.75
3. 20
4. 25
5. 36
6. 18 R2
7. 32
8. 10
9. 3
10. <
11. Obtuse
12. 6
13.  $55^\circ$
14.  $56^\circ$
15.  $270^\circ$
16.  $360^\circ$
17.  $60^\circ$
18.  $\frac{3}{4}$  by  $\frac{1}{12}$
19.  $\frac{7}{8}$
20.  $5\frac{1}{4}$

**PAGE 48**

1.
  - (a) hexagon
  - (b) nongan
  - (c) heptagon
  - (d) triangle
  - (e) quadrilateral
  - (f) octagon
  - (g) decagon
  - (h) pentagon
2.
  - (a) parallelogram
  - (b) square
  - (c) trapezium
  - (d) rectangle
  - (e) kite
  - (f) rhombus
3.
  - (a) right-angled
  - (b) equilateral
  - (c) isosceles
  - (d) scalene

**PAGE 49**

1. (b) kite;  
2 acute & 2 obtuse;  
irregular; yes
  - (c) parallelogram;  
2 acute & 2 obtuse;  
irregular; no
  - (d) \_\_\_ 3 acute  
irregular; yes
  - (e) trapezium  
\_\_\_  
irregular, yes
  - (f) nonagon  
9 obtuse;  
regular, yes
  - (g) 7  
obtuse,  
\_\_\_; no
  - (h) equilateral triangle,  
3 acute, regular, yes
2.
  - (a) 1 equilateral triangle,  
2 trapezia  
1 rectangle
  - (b) 2 triangles,  
3 parallelograms  
1 decagon (star)  
1 rectangle
  - (c) 4 triangles  
1 quadrilateral  
1 rectangle
  - (d) 3 trapezia and  
2 rectangles
  - (e) 3 triangles  
1 quadrilateral  
1 rectangle

**Challenge I:** (i)  $108^\circ$   
(ii)  $540^\circ$

**Challenge II:**  $136^\circ$

**PAGE 50**

1.
  - (a) (i)
  - (b) (ii)
  - (c) (i)
  - (d) (iii)
2. No answers
3. No answers

**PAGE 51**

1. No answers
2.
  - (a) squares and triangles
  - (b) squares and rhombuses
  - (c) hexagon and triangles
  - (d) squares and  
parallelograms
3.
  - (a) rotational
  - (b) simple
  - (c) simple
  - (d) simple and rotational
  - (e) rotational
  - (f) simple
4. No answers

**PAGE 52**

1. No answers
2. No answers.
3.
  - (b) right-angled triangle
  - (c) right-angled triangle
  - (d) square
  - (e) right-angled triangle
  - (f) parallelogram
  - (g) right-angled triangle
4. No answers.

**Challenge:** No answers

**PAGE 53**

1.
  - (a) sock
  - (b) fork
  - (c) plate
  - (d) shoe
  - (e) cup
  - (f) spider
  - (g) hat
  - (h) ruler
  - (i) eraser
  - (j) pencil
2.
  - (a) (3, 2)
  - (b) (4, 1)
  - (c) (1, 3)

- (d) (5, 2)
- (e) (2, 2)
- (f) (2, 3)
- (g) (5, 5)
- (h) (1, 2)
- (i) (3, 3)
- (j) (5, 4)
- (k) (4, 5)
- (l) (1, 5)
- (m) (1, 4)
- (n) (3, 1)

3.
  - (a) (1, 1)
  - (b) (2, 4)
  - (c) (6, 4)
  - (d) (5, 1)

4.
  - (a) (1, 0)
  - (b) (2, 4)
  - (c) (3, 1)
  - (d) (4, 3)
  - (e) (6, 6)
  - (f) (6, 1)
  - (g) (7, 4)
  - (h) (7, 0)

**PAGE 54**

1. No answers
2.
  - (a) castle
  - (b) picnic basket on rug
  - (c) Yacht
  - (d) octopus
  - (e) surf-board
  - (f) eagle
3.
  - (a) (0, 7)
  - (b) (8, 1)
  - (c) (7, 3)
  - (d) (2, 8)
  - (e) (2, 1)
  - (f) (9, 5)
4. No answers

5.  
**(a)** (1, 1); (1, 4);  
 (4, 4); (4, 1)  
**(b)** (3, 0); (1, 1);  
 (0, 2); (1, 4);  
 (3, 4); (5, 4);  
 (6, 2); (5, 1)

## PAGE 55

1.  
**(a)** Colour all  
 8  
**(b)** Colour all  
 30  
**(c)** Colour all  
 24
2. No answers

3.  
**(a)** 7  
**(b)** 4  
**(c)** 18  
**(d)** 20  
**(e)** 20  
**(f)** 45  
**(g)** 80  
**(h)** 120

4.  
**(a)** 6  
**(b)** 5  
**(c)** 12  
**(d)** 10  
**(e)** 25  
**(f)** 16  
**(g)** 24  
**(h)** 40

## PAGE 56

1.  
**(a)** 60  
**(b)**  $10^2/5\text{km}$   
**(c)** 12 yrs  
**(d)**  $17\frac{1}{2}\text{km}$

2.  
**(a)** 2:5  
**(b)** 1:6  
**(c)** 1:3  
**(d)** 3:5

3. 7:9  
 4. 5:7  
 5. 2:3  
 6. 3:4  
 7. 12:11  
**Challenge:** 3:5

## PAGE 57

1. No answers  
 2. 18km  
 3. 25  
 4. 15  
 5. €6  
 6. 1:4  
 7. 3:17  
 8. €144  
 9. 400m

**Challenge:** 168

## PAGE 58

1.  
**(a)** 20  
**(b)** 28  
**(c)** 25  
**(d)** 84  
**(e)** 81  
**(f)** 60  
**(g)** 350  
**(h)** 100  
**(i)** 121  
**(j)** 72
2.  
**(a)** €10  
**(b)** 350ml

3.  
**(a)**  $\frac{1}{10}$   
**(b)**  $\frac{2}{5}$   
**(c)**  $\frac{5}{8}$   
**(d)**  $\frac{2}{5}$

**Challenge:**  $\frac{2}{3}$

## PAGE 59

1. 1:1 (5 of each)  
 2.  $\frac{2}{5}$   
 3. 3:1  
 4.  $6\frac{7}{30}$   
 5.  $2\frac{5}{12}\text{kg}$

6. 10  
 7. €119  
 8. Purple  
 9.  $\frac{3}{5}$   
 10.  $1\frac{5}{6}\text{kg}$

## PAGE 60

1. €110  
 2. 15  
 3. 8 and 12  
 4.  $\frac{2}{3}\text{kg}$   
 5.  $13\frac{5}{18}\text{m}$   
 6. 2:1  
 7. 15  
 8. €32  
 9. 2:3

**Challenge:** €6

## PAGE 61

No answers.

## PAGE 62

1.  
**(a)**  $90 + 106$   
**(b)**  $299 + 4 + 400 - 67$   
**(c)**  $94 - 42$   
**(d)**  $448 - 271$   
**(e)**  $(4 \times 19) - 19$   
**(f)**  $29 \times 26 + 26$   
**(g)**  $(51 \times 6) \div 18$   
**(h)**  $(105 \times 2) \div 6$

2.  
**(a)** x, -  
**(b)** x, -  
**(c)** -, x  
**(d)** x, -  
**(e)** x, -  
**(f)** +, +

3.  
**(a)** 5; 9  
**(b)** 1 2, 8 7 6  
**(c)** 0 0 0  
**(d)** 3 8

4.  
**(a)** €9.10  
**(b)** €495  
**(c)** €20.29

- (d)** €15.20  
**(e)** €99  
**(f)** €77  
**(g)** €12.20  
**(h)** €115.50  
**(i)** €34.99

## PAGE 63

1.  
**(a)** - 7  
**(b)** - 30  
**(c)** - 500  
**(d)** - 2,000  
**(e)** - 8,000  
**(f)** - 4  
**(g)** - 90,000  
**(h)** - 900  
**(i)** - 30  
**(j)** - 300,000  
**(k)** - 3,000  
**(l)** - 90,000

2.  
**(b)**  $9 + 9 + 9 - 7 =$   
**(c)**  $7 + 7 =$   
**(d)**  $6 \times 8 - 8 \div 8 =$   
**(e)**  $3 \times 9 + 9 + 3 \div 3 =$   
**(f)**  $12 \times 6 \times 6 - 6 =$   
**(g)**  $20 - 8 \times 8 =$   
**(h)**  $6 \times 15 + 6 \div 6 =$

3. No answers  
 4. No answers

5.  
**(a)** 24, 25, 26  
**(b)** 96, 97, 98  
**(c)** 356, 357, 358  
**(d)** 489, 490, 491  
**(e)** 1545; 1546; 1547

**Challenge:** (a) 20  
 (b) 800  
 (c) 4,000

## PAGE 64

1.  
**(a)** (i)  $\frac{1}{10}$   
 (ii) 0.1  
**(b)** (i)  $\frac{1}{100}$   
 (ii) 0.01  
**(c)**  $\frac{1}{1000} = 0.001$

2. No answers.

3.

- (a) 0.45  
 (b) 2.3  
 (c) 1.375  
 (d) 4.03  
 (e) 7.45  
 (f) 6.023  
 (g) 0.4  
 (h) 0.006  
 (i) 9.99  
 (j) 0.07  
 (k) 3.003  
 (l) 4.044

4.

- (a)  $9/10$   
 (b)  $7/100$   
 (c)  $2^{19/100}$   
 (d)  $2^{1/1000}$   
 (e)  $3^{1/10}$   
 (f)  $4^{29/1000}$   
 (g)  $5^{51/1000}$   
 (h)  $2^{1/1000}$   
 (i)  $4^{44/100}$   
 (j)  $5^{207/1000}$   
 (k)  $6^{1/1000}$   
 (l)  $1^{111/1000}$

5.

- (a)  $9/10$   
 (b)  $2/5$   
 (c)  $2\frac{1}{2}$   
 (d)  $3\frac{27}{50}$   
 (e)  $1\frac{3}{5}$   
 (f)  $3\frac{4}{5}$   
 (g)  $2\frac{2}{25}$   
 (h)  $5\frac{1}{4}$   
 (i)  $1\frac{99}{100}$   
 (j)  $1/50$   
 (k)  $4\frac{4}{5}$   
 (l)  $8\frac{9}{100}$

**PAGE 65**

1.

- (a) 0.8  
 (b) 0.25  
 (c) 0.55  
 (d) 0.84  
 (e) 0.4  
 (f) 0.62  
 (g) 0.95

2.

- (a)  $0.77 = 77/100$   
 (b) ✓  
 (c)  $4\frac{4}{100} = 4.040$   
 (d)  $10/100 > 11/1000$   
 (e)  $6\frac{660}{1000} > 6.066$   
 (f)  $2.20 = 2\frac{20}{100}$   
 (g) ✓  
 (h)  $0.099 < 900/100$

3.

- (a) 0.5  
 (b) 0.6  
 (c) 0.75  
 (d) 0.05  
 (e) 0.16  
 (f) 0.875  
 (g) 0.44  
 (h) 0.625

4.

- (a) 833g  
 (b) 9.583 seconds  
 (c) 636m  
 (d) 666ml

5. No answers

6. No answers

**PAGE 66**

1.

- (a) 0.1, 0.101, 0.11, 0.111  
 (b) 7.0, 7.077, 7.707, 7.77  
 (c) 0.104, 0.133, 0.34, 0.43  
 (d) 1.06, 1.501, 1.506, 1.605

2.

- (a) 4.205, 4.215, 4.225  
 (b) 1.009, 1.110, 1.211  
 (c) 0.320, 0.640, 1.280  
 (d) 1.005, 0.995, 0.985  
 (e) 4.011, 5.122, 6.233  
 (f) 5.966, 6.021, 6.076

**Challenge:** (a)  $3/7$ 

- (b)  $4/9$   
 (c)  $6/13$   
 (d)  $7/15$   
 (e)  $8/17$

3.

- (i) (a) 8  
 (b) 1  
 (c) 41  
 (d) 3  
 (e) 1  
 (f) 7

(ii)

- (a) 5.9  
 (b) 10.0  
 (c) 6.1  
 (d) 2.2  
 (e) 9.0  
 (f) 7.8

(iii)

- (a) 9.00  
 (b) 3.72  
 (c) 15.51  
 (d) 0.01  
 (e) 8.89  
 (f) 7.80

(iv)

- (a) 4.353  
 (b) 4.281  
 (c) 10.201  
 (d) 8.100  
 (e) 30.037

4.

- (a) 5.5  
 (b) 4  
 (c) 0.890  
 (d) 10.51  
 (e) 6.10  
 (f) 5.556

**Challenge:** 10.29**PAGE 67**

1.

- (a) 14.609  
 (b) 4.769  
 (c) 14.535  
 (d) 8.103  
 (e) 13.065  
 (f) 45.994

2. 0.020kg

3. 1.382km

4. 0.611kg

5. 9kg

6. 2.892

7. 2.37l

8. 1.385

9. Rowan by 0.918kg

10. 0.593l

**Challenge:** 4.52l**PAGE 68**

1.

- (a) 1.22m; 1.85; 0.75m; 1.5m;  
 1.13m; 1.4m  
 (b) No answers  
 (c) 1.1m  
 (d) 1.2m; 1.9m; 0.8m; 1.5m;  
 1.1m; 1.4m  
 (e) 0.15m

2.

- A** = 0.091;  
**T** = 0.250;  
**O** = 0.299;  
**W** = 0.317;  
**E** = 0.594;  
**L** = 0.686

3.

- (a) (i) → (iii);  
 (ii) → (i)  
 (iii) → (v);  
 (iv) → (ii);  
 (v) → (iv);

- (b) (i) → (iv);  
 (ii) → (i);  
 (iii) → (v);  
 (iv) → (ii);  
 (v) → (iii);

4. 1,410

5. €1,785

**Challenge:** Pat: €441

Niall: €343

**PAGE 69**

1. 14

2. 64

3.  $18/21$ 4.  $11/18$ 5.  $3/40$ 6.  $5/8$ 7.  $13\frac{1}{2}$ 8.  $2/3$ 

9. Scalene

10. Trapezium

11. C

12.  $7/4$ 

13. 2:3

14. 40

15.  $\frac{4}{9}$   
 16.  $1\frac{4}{5}$   
 17. 17:7  
 18. 23:87  
 19. 7:895km  
 20. 30kg

## PAGE 70

1.  
**(b)** (i) (1, 8), (2, 4)  
 (ii) 1, 248  
**(c)** (i) (1, 11)  
 (ii) 1, 11  
**(d)** (i) (1, 16), (2, 8), (4, 4)  
 (ii) 1, 2, 4, 8, 16  
**(e)** (i) (1, 20), (2, 10), (4, 5)  
 (ii) 1, 2, 4, 5, 10, 20  
**(f)** (i) (1, 24), (2, 12), (3, 8), (4, 6)  
 (ii) 1, 2, 3, 4, 6, 8, 12, 24  
**(g)** (i) (1, 26), (2, 13)  
 (ii) 1, 2, 13, 26  
**(h)** (i) (1, 29)  
 (ii) 1, 29  
**(i)** (1, 36), (2, 18), (3, 12), (4, 9),  
 (6, 6)  
 (ii) 1, 2, 3, 4, 6, 12, 18, 36

## PAGE 71

1.  
**(a)** (i) 1, 2, 3, 6  
 (ii) 1, 2, 3, 6, 8, 12, 24  
 (iii) HCF = 6  
**(b)** (i) 1, 2, 4, 8  
 (ii) 1, 2, 3, 5, 6, 10, 15, 30  
 (iii) HCF = 2  
**(c)** (i) 1, 2, 3, 6, 9, 18  
 (ii) 1, 3, 5, 9, 15, 45  
 (iii) HCF = 9  
**(d)** (i) 1, 2, 5, 10,  
 (ii) 1, 2, 4, 5, 8, 10, 20, 40  
 (iii) HCF = 10  
**(e)** (i) 1, 2, 4, 5, 8, 10, 20, 40  
 (ii) 1, 2, 5, 10, 25, 50  
 (iii) HCF = 10  
**(f)** (i) 1, 3, 5, 9, 15, 45  
 (ii) 1, 2, 3, 5, 6, 10, 12, 20,  
 30, 60  
 (iii) HCF = 15  
**(g)** (i) 1, 2, 3, 4, 6, 8, 12, 24  
 (ii) 1, 2, 3, 4, 6, 9, 12, 18,  
 36  
 (iii) HCF = 12

- (h)** (i) 1, 2, 4, 5, 8, 10, 20  
 (ii) 1, 2, 4, 7, 14, 28  
 (iii) HCF = 4

- (i)** (i) 1, 2, 3, 6, 9, 18  
 (ii) 1, 3, 9, 27  
 (iii) HCF = 9

- (j)** (i) 1, 2, 4, 8, 16  
 (ii) 1, 2, 3, 6, 8, 12, 24  
 (iii) HCF = 8

- (k)** (i) 1, 2, 3, 6  
 (ii) 1, 3, 9  
 (iii) 1, 3, 5, 15  
 (iv) HCF = 3

- (l)** (i) 1, 11  
 (ii) 1, 2, 11, 22  
 (iii) 1, 3, 11, 33  
 (iv) HCF = 11

- (m)** (i) 1, 2, 4, 8  
 (ii) 1, 2, 3, 4, 6, 12  
 (iii) 1, 2, 4, 8, 16, 32  
 (iv) HCF = 4

- (n)** (i) 1, 2, 7, 14  
 (ii) 1, 5, 7, 35  
 (iii) 1, 2, 3, 6, 7, 14, 21, 42  
 (iv) HCF = 7

- (o)** (i) 1, 2, 3, 4, 6, 9, 12, 18, 36  
 (ii) 1, 2, 4, 11, 22, 44  
 (iii) 1, 2, 4, 7, 8, 14, 28, 56  
 (iv) HCF = 4

2. 12, 16, 20, 24, 28, 32, 36,  
 40, 44, 48

3.  
**(a)** 6, 12, 18, 24, 30, 36, 42, 48,  
 54, 60

- (b)** 7, 14, 21, 28, 35, 42, 49, 56,  
 63, 70

- (c)** 8, 16, 24, 32, 40, 48, 56,  
 64, 72, 80

- (d)** 10, 20, 30, 40, 60, 70, 80,  
 90, 100

- (e)** 13, 26, 39, 52, 65, 78, 91,  
 104, 117, 130

- (f)** 20, 40, 60, 80, 100, 120,  
 140, 160, 180, 200

- (g)** 100, 200, 300, 400, 500,  
 600, 700, 800, 900, 1000

4.  
**(a)** 2, 6, 12, 16, 20  
**(b)** 39, 18, 24, 30  
**(c)** 5, 15, 30, 40, 50  
**(d)** 9, 27, 54, 72, 90  
**(e)** 11, 33, 66, 88, 110  
**(f)** 12, 36, 72, 96, 120  
**(g)** 15, 45, 90, 120, 150

Challenge: 7, 14, 28, 35, 49, 63

## PAGE 72

1.  
**(a)** 12  
**(b)** 12, 24, 36, 48, 60, 72, 84,  
 96

2.  
**(a)** (i) 2, 4, 6, 8, 10, 12, 14, 16,  
 18, 20  
 (ii) 5, 10, 15, 20, 25, 30, 35,  
 40, 45, 50  
 (iii) LCM = 10

- (b)** (i) 3, 6, 9, 12, 15, 18, 21, 24,  
 27, 30  
 (ii) 8, 16, 24, 32, 40, 48, 56,  
 64, 72, 80  
 (iii) LCM = 24

- (c)** (i) 5, 10, 15, 20, 25, 30, 35,  
 40, 45, 50, 55, 60  
 (ii) 6, 12, 18, 24, 30, 36, 42,  
 48, 54, 60  
 (iii) LCM = 30

- (d)** (i) 7, 14, 21, 28, 35, 42, 49,  
 56, 63, 70  
 (ii) 8, 16, 24, 32, 40, 48, 56,  
 64, 72, 80  
 (iii) LCM = 56

- (e)** (i) 6, 12, 18, 24, 30, 36, 42,  
 48, 54, 60  
 (ii) 9, 18, 27, 36, 45, 54, 63,  
 72, 81, 90  
 (iii) LCM = 18

- (f)** (i) 4, 8, 12, 16, 20, 24, 28,  
 32, 36, 40  
 (ii) 5, 10, 15, 20, 25, 30, 35,  
 40, 45, 50  
 (iii) LCM = 20

- (g)** (i) 6, 12, 18, 24, 30, 36, 42,  
 48, 54, 60  
 (ii) 7, 14, 21, 28, 35, 42, 49,  
 56, 63, 70  
 (iii) LCM = 42

3. 36 days  
 4. 5 boxes; 6 packs  
 5. 28th  
 6. Day 35  
 7. 18th

Challenge: (a) 3 and 5  
 (b) 6 and 10

## PAGE 73

1.  
**(b)** 1, 2, 3  
**(c)** 1, 2  
**(d)** 1, 2, 3, 4  
**(e)** 1, 2  
**(f)** 1, 2

2.  
 Prime: 7; 67; 131; 419; 1741  
 Composite: 18; 45; 156; 578;  
 1332; 5000; 4032

Challenge: (a) 2nd, 3rd, 5th,  
 7th, 11th, 13th,  
 17th, 19th, 23rd,  
 29th

(b) 4th, 6th, 8th,  
 9th, 10th, 12th,  
 14th, 15th, 16th,  
 18th, 20th, 21st,  
 22nd, 24th, 25th,  
 26th, 27th, 28th,  
 30th

(c) no, because...

## PAGE 74

1.  
**(c)**  $2^4 = 16$   
**(d)**  $2^5 = 32$   
**(e)**  $2^6 = 64$   
**(f)**  $2^7 = 128$   
**(g)**  $2^8 = 256$   
**(h)**  $2^9 = 512$

2.  
**(b)**  $4^5 = 1,024$   
**(c)**  $5^7 = 78,125$   
**(d)**  $7^6 = 117,649$   
**(e)**  $9^5 = 531,441$   
**(f)**  $10^5 = 100,000$   
**(g)**  $15^3 = 3375$

- 3.**  
**(a)** 243  
**(b)** 2,401  
**(c)** 512  
**(d)** 46,656  
**(e)** 512  
**(f)** 16,384  
**(g)** 1

- 4.**  
**(a)** 260  
**(b)** 2,699  
**(c)** 281  
**(d)** 1354  
**(e)** 117  
**(f)** 145

**Challenge:** (a) 64  
 (i)  $2^6$   
 (ii)  $8^2$   
 (b) 128mins =  $2^7$

---

**PAGE 75**

- 1.**  
**(a)**  $1^2 = 1$   
**(b)**  $2^2 = 4$   
**(c)**  $3^2 = 9$   
**(d)**  $4^2 = 16$   
**(e)**  $5^2 = 25$   
**(f)**  $6^2 = 36$   
**(g)**  $7^2 = 49$   
**(h)**  $8^2 = 64$   
**(i)**  $9^2 = 81$   
**(j)**  $10^2 = 100$   
**(k)**  $11^2 = 121$   
**(l)**  $12^2 = 144$   
**(m)**  $13^2 = 169$   
**(n)**  $14^2 = 196$

**2.** No answers

- 3.**  
**(a)** 324  
**(b)** 529  
**(c)** 1,444  
**(d)** 1,936  
**(e)** 2,601  
**(f)** 3,364  
**(g)** 4,096  
**(h)** 6,241  
**(i)** 6,889  
**(j)** 9,216  
**(k)** 10,000

- 4.**  
**(a)** 34  
**(b)** 52  
**(c)** 53  
**(d)** 100  
**(e)** 181

- 5.**  
**(a)** 2  
**(b)** 4  
**(c)** 10  
**(d)** 7  
**(e)** 9  
**(f)** 8  
**(g)** 3  
**(h)** 11  
**(i)** 5  
**(j)** 1

- 6.**  
**(a)** 16  
**(b)** 15  
**(c)** 20  
**(d)** 23  
**(e)** 25  
**(f)** 30  
**(g)** 40

---

**PAGE 76**

- 1.**  
**(a)** 5,437  
**(b)** 6,158  
**(c)** 3,924.5  
**(d)** 510

- 2.**  
**(a)** 5,586  
**(b)** 360.36  
**(c)** 234,344  
**(d)** 230,112

- 3.**  
**(a)** 234.08  
**(b)** 259.42  
**(c)** 192.75  
**(d)** 729.93

- 4.**  
**(a)** 743.96  
**(b)** 3,079.7  
**(c)** 6,170.64  
**(d)** 7,337.64

- 5.**  
**(a)** 0.15  
**(b)** 0.36  
**(c)** 0.42  
**(d)** 0.25  
**(e)** 0.12  
**(f)** 0.48

- 6.**  
**(a)** 0.48  
**(b)** 0.27  
**(c)** 0.05  
**(d)** 0.49  
**(e)** 0.32  
**(f)** 0.42

- 7.**  
**(a)** 18  
**(b)** 1.8  
**(c)** 0.18  
**8.**  
**(a)** 18  
**(b)** 1.8  
**(c)** 0.18

- 9.**  
**(a)** 56  
**(b)** 5.6  
**(c)** 0.56

- 10.**  
**(a)** 36  
**(b)** 3.6  
**(c)** 0.36

**Challenge:** 120m

---

**PAGE 77**

- 1.**  
**(a)** 26.6  
**(b)** 2.66

- 2.**  
**(a)** 112.7  
**(b)** 11.27

- 3.**  
**(a)** 207.2  
**(b)** 20.72

- 4.**  
**(a)** 0.78  
**(b)** 2.45  
**(c)** 1.08  
**(d)** 1.65

- 5.**  
**(a)** 1.68  
**(b)** 0.74  
**(c)** 1.71  
**(d)** 4.92

- 6.**  
**(a)** 3.42  
**(b)** 4.25  
**(c)** 3.51  
**(d)** 5.04

- 7.**  
**(a)** 7.92  
**(b)** 11.04  
**(c)** 12.65  
**(d)** 12.58

- 8.**  
**(a)** 17.94  
**(b)** 21.09  
**(c)** 53.55  
**(d)** 67.68  
**9.** 4.44m  
**10.** €22.57  
**11.** 4.65m  
**12.** 6.89m

**Challenge:** 430.99m

---

**PAGE 78**

- 1.**  
**(a)** 26.64  
**(b)** 15.66  
**(c)** 31.05  
**(d)** 57.27

- 2.**  
**(a)** 39.1  
**(b)** 27  
**(c)** 83.62  
**(d)** 195.36

- 3.**  
**(a)** 96·2  
**(b)** 205·52  
**(c)** 448·26  
**(d)** 580·16

- 4.**  
**(a)** 417  
**(b)** 702·74  
**(c)** 472·85  
**(d)** 530·48

- 5.**  
**(a)** 1,900·79  
**(b)** 4,902·45  
**(c)** 2,544·1  
**(d)** 5,525·52

- 6.** 53·82

- 7.**  
**(a)** 109·04kg  
**(b)** 71·44kg

- 8.** 343·8 units  
**9.** 3001·97

- 10.**  
**(a)** 2075·94  
**(b)** 158·1

**Challenge:** 17·48m

---

**PAGE 79**

- 1.**  
**(a)** 23·646  
**(b)** 41·992  
**(c)** 54·873  
**(d)** 49·21

- 2.**  
**(a)** 26·904  
**(b)** 26·637  
**(c)** 77·868  
**(d)** 60·888

- 3.**  
**(a)** 45·214  
**(b)** 267·3  
**(c)** 306·642  
**(d)** 515·214

- 4.**  
**(a)** 974·58  
**(b)** 3,005·62  
**(c)** 5,345·65  
**(d)** 4,443·36

- 5.**  
**(a)** 30·268  
**(b)** 50·634  
**(c)** 250·244  
**(d)** 165·242

- 6.** 60·66  
**7.** 12·054km  
**8.** 152·448kg  
**9.** 83·98  
**10.** 72·816  
**11.** €12·65  
**12.** 11·34  
**13.** €598·72

**Challenge:** 34·006 m

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**PAGE 80**

- 1.**  
**(a)** 0·337  
**(b)** 2·45  
**(c)** 2·68  
**(d)** 0·366

- 2.**  
**(a)** 26·4  
**(b)** 0·168  
**(c)** 0·374  
**(d)** 2·88

- 3.**  
**(a)** 0·107  
**(b)** 26·3  
**(c)** 40·3  
**(d)** 1·28

- 4.**  
**(a)** 0·284  
**(b)** 46·7  
**(c)** 1·59  
**(d)** 23·7

- 5.**  
**(a)** 0·18  
**(b)** 1·48  
**(c)** 0·219  
**(d)** 2·35

- 6.** 248  
**7.** €4·60  
**8.** 18·62kg  
**9.** €8·30  
**10.** 15·9  
**11.** 0·138  
**12.** 46·7  
**13.** 0·39

**Challenge:** 1·18

---

**PAGE 81**

- 1.**  
**(a)** 7  
**(b)** 3  
**(c)** 8  
**(d)** 7  
**(e)** 7

- 2.**  
**(a)** 0·6  
**(b)** 0·5  
**(c)** 0·4  
**(d)** 0·8  
**(e)** 0·8

- 3.**  
**(a)** 4  
**(b)** 4  
**(c)** 6  
**(d)** 8  
**(e)** 7

- 4.**  
**(a)** 13  
**(b)** 9  
**(c)** 9  
**(d)** 5  
**(e)** 9

- 5.**  
**(a)** 0·8  
**(b)** 1·5  
**(c)** 1·8  
**(d)** 16  
**(e)** 9

- 6.**  
**(a)** 37  
**(b)** 2·7  
**(c)** 3·4  
**(d)** 4·6  
**(e)** 3·9

- 7.**  
**(a)** 0·36  
**(b)** 3·8  
**(c)** 0·37  
**(d)** 0·65  
**(e)** 7·8

- 8.**  
**(a)** 58  
**(b)** 2·9  
**(c)** 0·65  
**(d)** 8·6  
**(e)** 0·39

- 9.**  
**(a)** 47  
**(b)** 5·4  
**(c)** 0·65  
**(d)** 0·33  
**(e)** 6·9

**Challenge:** 8

---

**PAGE 82**

- 1.**  
**(a)** 25·7  
**(b)** 38·8  
**(c)** 27·6  
**(d)** 34·5  
**(e)** 28·3

- 2.**  
**(a)** 26·3  
**(b)** 25·9  
**(c)** 18·3  
**(d)** 22·7  
**(e)** 35·4

- 3.**  
**(a)** 16·8  
**(b)** 24·9  
**(c)** 31·9  
**(d)** 2·57  
**(e)** 3·04

- 4.**  
**(a)** 43·7  
**(b)** 20·6  
**(c)** 24·9  
**(d)** 238  
**(e)** 25·8

5.  
 (a) 14.7  
 (b) 24.25  
 (c) 3.4  
 (d) 57.2  
 (e) 2.78

6.  
 (a) 3.34  
 (b) 17.7  
 (c) 3.64  
 (d) 2.48  
 (e) 1.56

7. 9.2  
 8. 26  
 9. 15  
 10. 0.08km  
 11. 0.134l

Challenge: 107.64m

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**PAGE 83**

1.  
 (a) €145  
 (b) €238  
 (c) €36  
 (d) €83  
 (e) €91  
 (f) €46

2.  
 (a) €38  
 (b) €24  
 (c) €49  
 (d) €45  
 (e) €73  
 (f) €44

3.  
 (a) €77  
 (b) €53  
 (c) €44  
 (d) €254  
 (e) €85  
 (f) €39

4.  
 (a) 10.90  
 (b) 32.77  
 (c) 8.98  
 (d) 8.85

- (e) 32.46  
 (f) 3.79
5.  
 (a) €294.42  
 (b) €17.04  
 (c) €36.96  
 (d) €19.06  
 (e) €18.86  
 (f) €26.24

6. 53

7.  
 (a) 169  
 (b) €0.08

8. 75.48

9. 139

10. 67

11.  
 (a) 19 boxes  
 (b) €0.17 per box

12. €81.88  
 13. 158

Challenge: (a) 36.8 units  
 (b) €6.18

---

**PAGE 84**

1.  
 (a) 33hrs 45mins  
 (b) 5hrs 30mins  
 (c) 39hrs 15mins

2.  
 (a) 405mins  
 (b) 165mins

3. 45mins  
 4. 9,862 days  
 5. €15

6.  
 (a) €211.50  
 (b) €184.50  
 (c) €27

7. 218  
 8. 221

9. 61 days (inclusive)  
 10. 212  
 11. 137  
 12. €575  
 13. €595.10

Challenge: 256

---

**PAGE 85**

1.  
 (a) B  
 (b) D  
 (c) B  
 (d) B  
 (e) A  
 (f) C  
 (g) B

2.  
 (a) cm  
 (b) km  
 (c) m  
 (d) mm  
 (e) m  
 (f) mm  
 (g) cm or m

3.  
 (a) 8cm  
 (b) 4.5cm  
 (c) 3.5cm  
 (d) 11cm  
 (e) 7.5cm  
 (f) 3cm  
 (g) 15cm  
 (h) 5mm

4. No answers  
 5. 45,000m

Challenge:  
 (a) 420cm  
 (b) 4,200mm

---

**PAGE 86**

1.  
 (a) 0.63m  
 (b) 0.25m  
 (c) 0.72m  
 (d) 0.14m  
 (e) 1.36m

- (f) 2.45m  
 (g) 0.08m  
 (h) 0.6m

2.  
 (a) 34cm  
 (b) 57cm  
 (c) 18cm  
 (d) 80cm  
 (e) 129cm  
 (f) 706cm  
 (g) 550cm  
 (h) 801cm

3. 0.13m

4.  
 (a) 0.542km  
 (b) 0.006km  
 (c) 0.073km  
 (d) 0.270km  
 (e) 0.09km  
 (f) 0.011km  
 (g) 1.43km  
 (h) 3.472km

5.  
 (a)  $7^3/1000$ km  
 (b)  $3^8/1000$ km  
 (c)  $4^1/100$ km  
 (d)  $9/1000$ km  
 (e)  $5/100$ km  
 (f)  $5^8/100$ km  
 (g)  $4/100$ km  
 (h)  $2^3/100$ km  
 (i)  $5^{16}/100$ km  
 (j)  $3^2/1000$ km  
 (k)  $5^{704}/1000$ km  
 (l)  $9^8/100$ km

6.  
 (a) 300m  
 (b) 400km  
 (c) 590m  
 (d) 700m  
 (e) 316m  
 (f) 5,700m  
 (g) 7m  
 (h) 6,200m  
 (i) 4,900m  
 (j) 3,005m  
 (k) 6,259m

- (l) 3,130m  
 (m) 9,010m  
 (n) 450m  
 (o) 309m

**Challenge:** 853.5km

## PAGE 87

1.

- (a) 5m 90cm  
 (b) 5m 34cm  
 (c) 8.82m  
 (d) 9.43m  
 (e) 15.02m  
 (f) 12.95m

2.

- (a) 8cm 9mm  
 (b) 8.6cm  
 (c) 53.2cm  
 (d) 8km 11m  
 (e) 13.195km  
 (f) 83.405km

3.

- (a) 4m 86cm  
 (b) 1.81m  
 (c) 4.42m  
 (d) 2cm 3mm  
 (e) 9.9cm  
 (f) 14.7cm

4.

- (a) 5km 457m  
 (b) 2km 677m  
 (c) 3.899km  
 (d) 5.479km  
 (e) 17.683km  
 (f) 26.288km

**Challenge:** 25.5m

## PAGE 88

1.

- (a) 13cm 6mm  
 (b) 16.8cm  
 (c) 32.2cm  
 (d) 43m 44cm  
 (e) 69.84m  
 (f) 310.95m

2.

- (a) 10km 730m  
 (b) 21km 948m  
 (c) 16.908km  
 (d) 84.645km  
 (e) 176.584km  
 (f) 126.049km

3.

- (a) 2cm 3mm  
 (b) 2cm 7mm  
 (c) 3.8cm  
 (d) 5.8cm  
 (e) 6.6cm  
 (f) 12.3cm

4.

- (a) 15.62m  
 (b) 6.21m  
 (c) 3.84m  
 (d) 8.16m

5.

- (a) 14km 760m  
 (b) 12km 300m  
 (c) 18.72km  
 (d) 16.264km  
 (e) 35km 870m  
 (f) 7km 821m

6.

- (a) 34.84m  
 (b) 3.07m  
 (c) 39.2cm  
 (d) 0.604  
 (e) 56.7cm  
 (f) 191.35cm

**Challenge:** (a) 146cm  
 (b) 8.76m

## PAGE 89

1.

- (a) 145m  
 (b) 105m  
 (c) 70m  
 (d) 15m  
 (e) 350m  
 (f) 460m  
 (g) 110m

2.

- (i) 20m  
 (ii) 20m  
 (iii) 34m

**Challenge:** 95cm

## PAGE 90

1. 210cm  
 2. 0.198km  
 3. 403.3m  
 4. 0.269km  
 5. 99.36m  
 6. 29.9m  
 7. 30km  
 8. 379.755km

9.

- (a) 24.8m  
 (b) 159.5m

10. 562.8m

11. 3.14m

12. 111.744km

**Challenge:** (b) 3.7

## PAGE 91

1. 300,000

2. 28,300

3. 15

4. 5:2

5.  $\frac{2}{9}$

6. 36

7. 7.059

8. 27

9. 8.970km

10. 42

11. 36

12. Yes

13. 81

14. 12cm

15. 11

16. 1.02

17. 9

18. 9cm

19. 16.25m

20. 1.55km

## PAGE 92

1.

(b)  $\frac{25}{100}$ , 0.25, 25%

(c)  $\frac{13}{100}$ , 0.13, 13%

(d)  $\frac{31}{100}$ , 0.31, 31%

(e)  $\frac{19}{100}$ , 0.19, 19%

(f)  $\frac{11}{100}$ , 0.11, 11%

(g) (i) 100%  
 (ii) 0%

2.

(a) 50%

(b) 9%

(c) 50%

(d) 80%

(e) 55%

(f) 15%

(g) 63%

(h) 79%

(i) 90%

(j) 98%

3.

(a) 14%

(b) 44%

(c) 60%

(d) 65%

(e) 50%

(f) 36%

(g) 40%

(h) 52%

(i) 95%

4.

(a) 66.66

(b) 42.85%

(c) 44.44%

(d) 23.33%

(e) 16.66%

(f) 41.66%

(g) 62.5%

(h) 83.33%

(i) 77.77%

(j) 91.66%

5.

(a) 66.66%

(b) 3.78%

(c) 45.33%

(d) 16.66%

(e) 74.88%

(f) 93.27%



**PAGE 93**

- 1.**  
**(a)** 25%  
**(b)** 37.5%  
**(c)** 42%  
**(d)** 41.66%  
**(e)** 66.66%  
**(f)** 46.66%  
**(g)** 55%  
**(h)** 12.5%
- 2.**  
**(a)**  $\frac{3}{25}$ , 0.12,  
**(b)**  $\frac{7}{10}$ , 0.7  
**(c)**  $\frac{9}{20}$ , 0.45  
**(d)**  $\frac{1}{25}$ , 0.04  
**(e)**  $\frac{1}{2}$ , 0.5  
**(f)**  $\frac{1}{20}$ , 0.05
- 3.**  
**(a)**  $\frac{3}{8}$ , 0.375  
**(b)**  $\frac{1}{9}$ , 0.111  
**(c)**  $\frac{2}{3}$ , 0.666  
**(d)**  $\frac{5}{12}$ , 0.416  
**(e)**  $\frac{5}{6}$ , 0.833  
**(f)**  $\frac{1}{6}$ , 0.166

**Challenge I:** 20.83%

**Challenge II:** 71.42%

**PAGE 94**

- 1.**  
**(a)**  $\frac{5}{8}$ ; 0.625; 62  $\frac{1}{2}$ %  
**(b)**  $\frac{2}{3}$ ; 0.666; 66  $\frac{2}{3}$ %  
**(c)**  $\frac{2}{6}$ ; 0.3333; 33.33%  
**(d)**  $\frac{2}{9}$ ; 0.2222; 22.22%  
**(e)**  $\frac{7}{12}$ ; 58.333; 58  $\frac{1}{3}$ %
- 2.**  
**(a)**  $\frac{3}{5}$ ; 70%; 0.8  
**(b)**  $\frac{2}{5}$ ; 0.48; 56%  
**(c)** 60%; 0.75;  $\frac{9}{10}$   
**(d)** 50%;  $\frac{5}{8}$ ; 0.75  
**(e)** 0.24; 30%;  $\frac{9}{25}$   
**(f)**  $\frac{5}{9}$ ; 66  $\frac{2}{3}$ %; 0.777

**3. YOUR AGE****PAGE 95**

- 1.**  
**(a)** 25%  
**(b)** 70%  
**(c)** 30%  
**(d)** 80%
- 2.**  
**(a)** 20%  
**(b)** 15%  
**(c)** 13%  
**(d)** 7%  
**(e)** 1%  
**(f)** 44%
- 3.**  
**(b)** 0.89  
**(c)** 0.76  
**(d)** 0.71  
**(e)** 0.58
- 4.** €34  
**5.** €62.40

**Challenge:** (a) 0.24  
 (b) 0.29  
 (c) 0.45

**PAGE 96**

- 1.**  
**(a)** 1hr 34mins  
**(b)** 2hrs 5mins  
**(c)** 1hr 40mins  
**(d)** 1hr 43mins  
**(e)** 2hrs 33mins
- 2.**  
**(a)** 217 secs  
**(b)** 334 secs  
**(c)** 150 secs  
**(d)** 275 secs  
**(e)** 442 secs
- 3.**  
**(a)** 3hrs 17mins  
**4.** 4hrs 38mins  
**5.** 31mins  
**6.** 27  $\frac{1}{2}$  mins  
**7.** 32mins 33secs  
**8.** 23mins 58secs  
**9.** 51mins

- 10.** (i) 16:04; 4-04pm  
 (ii) 18:55; 6-55pm  
 (iii) 19:20; 7-20pm  
 (iv) 22:33; 10-33pm  
 (v) 23:43; 11-43pm

- 11.**  
**(a)** 3hrs 30mins  
**(b)** 50mins  
**(c)** 4hrs

- 12.**  
**(a)**  
**(b)** X  
**(c)**  
**(d)** X

**Challenge:** Denis

- (a) 13: 46  
 (b) 16: 48

Mrs Doubtfire

- (a) 17: 34  
 (b) 19: 39

Casper

- (a) 16: 56  
 (b) 20:04

Home Alone

- (a) 20:06  
 (b) 23:17

Harry Potter

- (a) 20:26  
 (b) 00:27

**PAGE 97**

- 1.**  
**(a)** 2hrs  
**(b)** 4hrs  
**(c)** 5hrs  
**(d)** 1  $\frac{1}{2}$  hrs  
**(e)** 2  $\frac{1}{2}$  hrs  
**(f)** 4  $\frac{1}{2}$  hrs  
**(g)** 2 hrs 20mins  
**(h)** 4hrs 15mins  
**(i)** 4hrs 45mins
- 2.**  
**(a)** 2hrs  
**(b)** 3hrs  
**(c)** 4hrs  
**(d)** 4  $\frac{1}{2}$ hrs  
**(e)** 2  $\frac{1}{2}$  hrs  
**(f)** 3  $\frac{1}{2}$  hrs

- (g)** 3hrs 15mins  
**(h)** 4hrs 45mins  
**(i)** 5hrs

- 3.**  
**(a)** 3hrs  
**(b)** 15:45

- 4.** 3hrs 45mins  
**5.** 108km/h  
**6.** 92.8km/h  
**7.** 24km/h  
**8.** 84km  
**9.** 325km  
**10.** 2,975km  
**11.** 1,129.5km

**Challenge:** 74km/h

**PAGE 98**

- 1.**  
**(a)** (i) Eoin  
 (ii) Darragh  
**(b)** 22 secs  
**(c)** (i) Darragh, Amy, Mike  
 (ii) Chloe, Marie, Eoin

- 2.**  
**(a)** 10.4384 – 10.44  
**(b)** 9.5328 – 9.53  
**(c)** 10.422 – 10.42  
**(d)** 9.372 – 9.37  
**(e)** 9.263 – 9.26  
**(f)** 8.403 – 8.40

- 3.**  
**(a)** 6.25m/s  
**(b)** 4.17  
**(c)** 5.56  
**(d)** 5.00  
**(e)** 3.85  
**(f)** 3.57

**Challenge:** 5m/s

## PAGE 99

- 1.**  
**(a)** (i) 13:00  
 (ii) 16:00  
 (iii) 10:00  
 (iv) 19:00
- (b)** (i) 18:00  
 (ii) 21:00  
 (iii) 15:00  
 (iv) 00:00
- (c)** (i) 11:00  
 (ii) 14:00  
 (iii) 08:00  
 (iv) 17:00
- (d)** (i) 04:00  
 (ii) 07:00  
 (iii) 01:00  
 (iv) 10:00
- (e)** (i) 08:00  
 (ii) 11:00  
 (iii) 05:00  
 (iv) 14:00
- (f)** (i) 07:30  
 (ii) 10:30  
 (iii) 04:30  
 (iv) 13:30

## PAGE 100

- 1.**  
**(a)** 12.00 (noon)  
**(b)** 2.00am (Wed)  
**(c)** 3.00am (Wed)  
**(d)** 6.00pm  
**(e)** 5.00pm  
**(f)** 1.00am (Wed)
- 2.**  
**(a)** 10.00pm (Mon)  
**(b)** 11.00pm (Mon)  
**(c)** 7.00am  
**(d)** 5pm (Mon)  
**(e)** 12.00 Midnight  
**(f)** 1.00am
- 3.**  
**(a)** Time Diff -5hrs  
**(b)** Time Diff +1hr; 16:03  
**(c)** Time Diff +1hr; 13:10  
**(d)** Time Diff +3hrs; 18:15  
**(e)** Time Diff +2hrs; 16:52

- Challenge:** (a) Time Diff -5hrs  
 NY;  
 7hrs 30mins
- (b) Time Diff +5hrs  
 Dub;  
 6hrs 40mins
- (c) earths rotation;  
 prevailing winds

## PAGE 101

- 1.** True: (b) (e) (h)  
 False (a) (c) (d) (f) (g)
- 2.**  
**(a)** = (b) > (c) = (d) <  
**(e)** < (f) = (g) < (h) =
- 3.**  
**(a)** 13  
**(b)** 4  
**(c)** 8  
**(d)** 4  
**(e)** 6  
**(f)** 20  
**(g)** 3  
**(h)** 5  
**(i)** 7  
**(j)** 9  
**(k)** 40  
**(l)** 72  
**(m)** 9  
**(n)** 8  
**(o)** 9  
**(p)** 54
- 4.**  
**(a)** 8  
**(b)** 5  
**(c)** 8  
**(d)** 4  
**(e)** 8  
**(f)** 5  
**(g)** 4  
**(h)** 7

## PAGE 102

- 1.**  
**(a)**  $19 - 12 = 7$   
**(b)**  $6 \times 12 = 72$   
**(c)**  $24 \div 3 = 8$   
**(d)**  $25 + 13 + 12 = 50$

- (e)**  $(23 - 8) + 5 = 20$   
**(f)**  $(5 + 8) - 4 = 9$   
**(g)**  $(\text{€}8 - \text{€}5) + \text{€}9 = \text{€}12$   
**(h)**  $(4 \times 8) = 32$   
**(i)**  $42 \div 7 = 6$   
**(j)**  $(7 \times 8) = 56$

**2.** No answers.

**3.**

- (a)**  $12 + 9 - 8 = 13$   
**(b)**  $7 \times 8 + 5 = 61$   
**(c)**  $(75 - 3) \div 8 = 9$   
**(d)**  $9 \times 7 - 4 = 59$

## PAGE 103

- 1.**  
**(a)** 77  
**(b)** 54  
**(c)** 73  
**(d)** 96  
**(e)** 62  
**(f)** 86
- 2.**  
**(a)**  $3 \times 39 = 117$   
**(b)**  $54 + 54 = 108$   
**(c)**  $76 \times 3 = 228$   
**(d)**  $77 + 54 = 131$   
**(e)**  $73 \times 2 = 146$   
**(f)**  $146 + 96 = 242$   
**(g)**  $(3 \times 54) + (2 \times 77) = 316$   
**(h)**  $(3 \times 41) - 86 = 37$   
**(i)**  $(6 \times 56) - (2 \times 65) = 206$   
**(j)**  $(3 \times 72) + (3 \times 58) = 390$
- 3.**  
**(i)** 199  
**(ii)** 246  
**(iii)** 238  
**(iv)** 415  
**(v)** 389  
**(vi)** 225
- 4.**  
**(a)** 142  
**(b)** 63  
**(c)** 131  
**(d)** 11  
**(e)** 194  
**(f)**  $O + T = 162$  or 193

**5. C+G:**

- (a)**  $47 + 69 = 116$   
**(b)**  $39 + 69 = 108$   
**(c)**  $41 + 69 = 110$   
**(d)**  $72 + 69 = 141$

## PAGE 104

- 1.**  
**p+w**  $\text{€}1.30 + \text{€}0.30$   
 $\rightarrow \mathbf{p+w} = \text{€}1.60$
- v+m**  $\text{€}1.10 + \text{€}0.50$   
 $\rightarrow \mathbf{v+m} = \text{€}1.60$
- b+n+w**  $\text{€}2.90 + \text{€}1.20 + \text{€}0.30$   
 $\rightarrow \mathbf{b+n+w} = \text{€}4.40$
- f+m+v**  $\text{€}2.70 + \text{€}0.50 + \text{€}1.10$   
 $\rightarrow \mathbf{f+m+v} = \text{€}4.30$
- 2.**  
**p+n+m**  $\text{€}1.30 + \text{€}1.20 + \text{€}0.50$   
 $\rightarrow \mathbf{p+h+m} = \text{€}3$
- f+2n+2w**  $\text{€}2.70 + (2 \times \text{€}1.20) + (2 \times \text{€}0.30)$   
 $\rightarrow \mathbf{f+2n+2w} = \text{€}5.70$
- 3b+3v+2w+m**  $(3 \times \text{€}2.90) + (3 \times \text{€}1.10) + (2 \times \text{€}0.30) + 0.50$   
 $\rightarrow \mathbf{3b+3v+2w+m} = \text{€}13.10$
- 3.**  
**(b+v)+3n**  $(\text{€}2.90 + \text{€}1.10) + (3 \times \text{€}1.20)$   
 $\rightarrow \mathbf{b+v+3n} = \text{€}7.60$
- (p+b)+2m**  $(\text{€}1.30 + \text{€}2.90) + (2 \times \text{€}0.50)$   
 $\rightarrow \mathbf{p+b+2m} = \text{€}5.20$
- 3(f+v)+2w+m**  $3 \times (\text{€}2.70 + \text{€}1.10) + (2 \times \text{€}0.30) + \text{€}0.50$   
 $\rightarrow \mathbf{3(f+v)+2w+m} = \text{€}12.50$
- $\rightarrow \mathbf{2(h+b)+2m} = \text{€}9.20$
- 4.**  
**(a)** W  
**(b)** B  
**(c)** V

- (d) 2  
 (e) B  
 (f) 4  
 (g) V  
 (h) P  
 (i) P

**Challenge:**  $2V + 3B + 4F + 3N + 2P + 4M + 8W = €32.30$

**PAGE 105**

1.  
 (a) 4  
 (b) 4  
 (c) 6  
 (d) 3  
 (e) 7  
 (f) 8  
 (g) 8  
 (h) 8  
 (i) 12  
 (j) 7  
 (k) 8  
 (l) 12
2.  
 (a) 8  
 (b) 5  
 (c) 11  
 (d) 8  
 (e) 10  
 (f) 8  
 (g) 7  
 (h) 7  
 (i) 6  
 (j) 6  
 (k) 6  
 (l) 6
3.  
 (a) 2  
 (b) 4  
 (c) 7  
 (d) 6  
 (e) 7  
 (f) 5  
 (g) 8  
 (h) 8  
 (i) 5  
 (j) 8  
 (k) 9

- (l) 9
4.  
 (a)  $n = 6$   
 (b)  $48 - 3 = n$  ( $n = 45$ )  
 (c)  $€4.8 \div 3 = n$  ( $n = 16$ )  
 (d)  $2n = 8$  ( $n = 4$ )  
 (e)  $9 + n = 15$  ( $n = 6$ )  
 (f)  $8 \div 2 = n$  ( $n = 4$ )  
 (g)  $n + 8 = 12$  ( $n = 4$ )  
 (h)  $n - 9 = 17$  ( $n = 26$ )  
 (i)  $n - 12 = 14$  ( $n = 26$ )

**PAGE 106**

1.  
 (a) 4  
 (b) 4  
 (c) 6  
 (d) 8  
 (e) 8  
 (f) 7  
 (g) 9  
 (h) 6  
 (i) 11  
 (j) 11  
 (k) 9  
 (l) 10
2.  
 (a) 4  
 (b) 6  
 (c) 6  
 (d) 7  
 (e) 4  
 (f) 45  
 (g) 8  
 (h) 9  
 (i) 10  
 (j) 5  
 (k) 38  
 (l) 7  
 (m) 8  
 (n) 0.2  
 (o) 1.5  
 (p) 2.3
3.  
 (a) 5  
 (b) 3  
 (c) 11  
 (d) 4  
 (e) 5

- (f) 3  
 (g) 5  
 (h) 6  
 (i) 7  
 (j) 10  
 (k) 8  
 (l) 6

**Challenge I:**  $x + 12 = 23$   
 ( $x = 11$ )

**Challenge II:**  $(3 \times n) + 3 = 30$   
 ( $n = 9$ )

**PAGE 107**

1.  
 (a) 14  
 (b) 12  
 (c) 30  
 (d) 42  
 (e) 48
2.  
 (a) 56  
 (b) 54  
 (c) 72  
 (d) 80  
 (e) 120
3.  
 (a) 15  
 (b) 16  
 (c) 40  
 (d) 35  
 (e) 40
4.  
 (a) 40  
 (b) 42  
 (c) 56  
 (d) 36  
 (e) 80
5.  
 (a) 64  
 (b) 72  
 (c) 108  
 (d) 256  
 (e) 225
6.  
 (a) 329  
 (b) 290

- (c) 675  
 (d) 850  
 (e) 564
7.  
 (a) 56  
 (b) 120  
 (c) 96  
 (d) 65  
 (e) 104

8.  
 (a) 64  
 (b) 171  
 (c) 192  
 (d) 117  
 (e) 187

**Challenge I:** €84

**Challenge II:** 96

**PAGE 108**

1.  
 (a) 9  
 (b) 1  
 (c) 5  
 (d) 3
2.  
 (a) 17  
 (b) 20  
 (c) 18  
 (d) 27
3.  
 (a) 36  
 (b) 192  
 (c) 146  
 (d) 3
4.  
 (a) 4  
 (b) 14  
 (c) 46  
 (d) 204
5.  
 (a) 100  
 (b) 6  
 (c) 13  
 (d) 24

- 6.**  
**(a)** 39  
**(b)** 15  
**(c)** 9  
**(d)** 15
- 7.**  $13 + x = 24$ ; 11  
**8.**  $64 - x = 12$ ;  $x = 52$   
**9.**  $x = 29 + 34$  (63)  
**10.**  $\frac{3}{8} \times 9$ ;  $x = 24$  (€24)  
**11.**  $\frac{5}{9} x = 45$ ;  $x = 81$  (€81)

**Challenge:** (a) 12cm  
 (b) 6cm

**PAGE 109**

- 1.**  
**(a)** 1,620  
**(b)** 324  
**(c)** 430  
**(d)** €459.20
- 2.**  
**(a)** 25  
**(b)** 35  
**(c)** 15  
**(d)** 10  
**(e)** Sat/Sun

**Challenge:** €4,352.95

**PAGE 110**

- 1.**  
**(a)** (i) 65,000  
 (ii) 25,000  
 (iii) 49,000
- (b)** 30,000  
**(c)** 49,000  
**(d)** July and August
- 2.**  
**(a)** August  
**(b)** May, June, July, Aug  
**(c)** September  
**(d)** July  
**(e)** 21,000  
**(f)** decrease

**PAGE 111**

- 1.**  
**(a)** 3pm and 4pm  
**(b)** 14  
**(c)** 16  
**(d)** 24  
**(e)** 84
- 2.**  
**(b)** (i) Sunday  
 (ii) Friday
- (c)** Tue, Thurs, Sat, Sun  
**(d)** 19  
**(e)** 54

**Challenge:** Friday

**PAGE 112**

- 1.**  
**(a)** (i) March  
 (ii) August
- (b)** Mar, Sept, Oct, Nov, Dec  
**(c)** Nov  
**(d)** Feb, Apr, May, Jun, Jul, Aug
- (e)** (i) 542  
 (ii) 116  
 (iii) 166  
 (iv) 576

- (f)** 350  
**(g)** €4.65  
**(h)** €404.55

- 2.**  
**(a)** (i) 2,400  
 (ii) 2,900  
 (iii) 3,800  
 (iv) 4,110  
 (v) 4,900

**(b)** No answers

**PAGE 113**

- 1.** 900,000  
**2.** €16  
**3.** 7  
**4.** €6  
**5.** 80%  
**6.** €20  
**7.** 0.73

- 8.** 180  
**9.** 37.5km  
**10.** 80km/h  
**11.** 09:45  
**12.**  $105^\circ$   
**13.** 18:30  
**14.** 15:00  
**15.**  $y = 23 \times 4$  (92)  
**16.** 24
- 17.**  $24 + 15 = 39$  or  
 $39 - 15 = 24$
- 18.** (i) 80  
 (ii) 20
- 19.** 125  
**20.** 0.312

**PAGE 114**

- 1.**  
**(a)** 69  
**(b)** 89  
**(c)** 3  
**(d)** 222
- 2.**  
**(a)** (i) 20  
 (ii) 14  
 (iii) 8  
 (iv) 15
- (b)** (i) 30  
 (ii) 6.5  
 (iii) 17.5  
 (iv) 6  
 (v) 9  
 (vi) 28

- 3.**  
**(a)** €4  
**(b)** 92g  
**(c)** 1.5km  
**(d)** 30cm  
**(e)** €0.36

- (f)** 1cm  
**(g)** 21l  
**(h)** 264m  
**(i)** 182m

**4.** 600; 387; 300; 270; 171; 72

**PAGE 115**

- 1.**  
**(a)** (i) 5cm  
 (ii) 16cm  
 (iii) 8cm  
 (iv) 13cm  
 (v) 13cm
- (b)** (i) Jenny  
 (ii) Tom  
 (iii) Helen  
 (iv) Adam  
 (v) Barry

- 2.**  
**(a)** 3  
**(b)** 100  
**(c)** 11  
**(d)** 154  
**(e)** 20

- 3.**  
**(a)** 30  
**(b)** 36  
**(c)** 27  
**(d)** 5  
**(e)** 5

- 4.**  
**(a)** Seal  
**(b)** Crocodile  
**(c)** elephant  
**(d)** Goose  
**(e)** Lion Cub  
**(f)** Chimpanzee

- 5.**  
**(a)** €4  
**(b)** €2.40  
**(c)** €8  
**(d)** €8.16  
**(e)** €9.60

**Challenge:** 33%

**PAGE 116**

- 1.**  
**(a)** €8  
**(b)** 28  
**(c)** 5 days  
**(d)** 19mins

2.  
 (a) 16  
 (b) 20  
 (c) 30  
 (d) 32  
 (e) 10  
 (f) 35  
 (g) 11  
 (h) 24  
 (i) 28

3.  
 (a) 16  
 (b) 55  
 (c) 30  
 (d) 27  
 (e) 15  
 (f) 290  
 (g) 77  
 (h) 84  
 (i) 102

Challenge: 132

---

**PAGE 117**

1.  
 (a) 63  
 (b) 99  
 (c) 7  
 (d) €28
2.  
 (a) €13.68  
 (b) €19.68  
 (c) €22.32  
 (d) €32  
 (e) €10  
 (f) €35
3.  
 (a) 146  
 (b) 56.25  
 (c) 11  
 (d) 60  
 (e) 29  
 (f) 90
4.  
 (a) 2.64km  
 (b) €131.25  
 (c) €6,604  
 (d) €7.52

**PAGE 118**

1.  
 (a) (i) 6kg  
      (ii) 60kg  
 (b) (i) 15cm  
      (ii) 30cm  
 (c) (i) €12  
      (ii) €20  
 (d) (i) 45l  
      (ii) 27l  
 (e) (i) 24km  
      (ii) 32km
2.  
 (a) 60%  
 (b) 40%  
 (c)  $33\frac{1}{3}\%$   
 (d) 11.1%

3.  $37\frac{1}{2}\%$

4. 27.6kg

5. 200

6. 27%

Challenge: 157.14cm

---

**PAGE 119**

1.  
 (a) 140  
 (b) 60  
 (c) 6  
 (d) 49
2.  
 (a) 14  
 (b) 42  
 (c) 28  
 (d) 102
3. 62.5km/h
4.  
 (a) €5 – (b)  
 (b) (2.25) – (d)  
 (c) €1.20 – (e)  
 (d) €1.25 – (a)  
 (e) €2 – (c)

5.  
 (a)  
 (b)  
 (c) X  
 (d) X  
 (e)  
 (f)

Challenge:

- (s) = 1.4  
 (p) = 1.47  
 (o) = 3.75  
 (t) = 2.015  
 (r) = 3  
 (f) = 6  
 (u) = 3.5  
 (e) = 1.5  
 (s) = 2.42

FOOTSTEPS

---

**PAGE 120**

1.  
 (a) +4  
 (b) +2  
 (c) –1  
 (d) –4  
 (e) –6  
 (f) –3

2.  
 (a) 3  
 (b) 2  
 (c) 2  
 (d) 4  
 (e) 6  
 (f) 7  
 (g) 5  
 (h) 10

3. 4  
 4. 6

5.  
 (a) –2  
 (b) +4  
 (c) +3  
 (d) –6  
 (e) +1
6. –6, –5, –3, –2, +2, +3

7.  
 (a) 2  
 (b) 2  
 (c) 5  
 (d) 4  
 (e) 5  
 (f) 8  
 (g) 6

---

**PAGE 121**

1.  
 (a) Miami  
 (b) Minneapolis
2. Barcelona, Shanghai  
 3. Chicago, Volgograd  
 4. 5° C  
 5. 7° C  
 6. 11° C

- 
7.  
 (a) 2° C  
 (b) 6°

8.  
 (a) Chicago  
 (b) 2° C

9.  
 (a) Volgograd  
 (b) 8° C

10. 24° C  
 11. 25° C  
 12. 37° C

13.  
 (a) +20° –1° +6° +2° –6°  
 (b) +12° –9° –2° 0° –14°  
 (c) +24° +3° +10° +6° –2°  
 (d) +7° –14° –7° –11° –19°

---

**PAGE 122**

1.  
 (a) –20km/h  
      +10km/h  
      –5km/h  
 (b) +2km/h  
      –5km/h  
      +10km/h

- (c) + 5km/h  
+ 10km/h  
- 5km/h

2.  
(a) Ronan  
(b) Maria  
(c) Ronan

3.  
(a) Ciara  
(b) Ronan  
(c) Maria

4.  
(a) +2  
(b) +4  
(c) -2  
(d) 0  
(e) +19  
(f) +11  
(g) -2  
(h) +4  
(i) -7  
(j) -3

## PAGE 123

1.  
(a) +6  
(b) -5  
(c) 0  
(d) -1  
(e) -4  
(f) +5  
(g) +2  
(h) -3  
(i) +1  
(j) 0

2.  
(a) -1  
(b) +7  
(c) 0  
(d) -1  
(e) +6  
(f) -2  
(g) -2  
(h) +2  
(i) +6  
(j) -3

3. - 12m

4.  
(c) +10; +85  
(d) -30; +55  
(e) -50; +5  
(f) +25; +30  
(g) -40; -10  
(h) +20; +10  
(i) €10  
(j) Yes! Otherwise she would have been in the red (debt)

## PAGE 124

1.  
(a) Wheel invented  
(b) World War 2
2. 476 years
3.  
(a) 940 yrs  
(b) 1,144 yrs  
(c) 650 yrs  
(d) 1,445 yrs  
(e) 3,456 yrs
4. 5,439 yrs

5.  
(a) - 3,200  
(b) + 80  
(c) + 1,889  
(d) + 1,659  
(e) - 214  
(f) + 1,886  
(g) + 1,173  
(h) - 2,560

6.  
(a) 1,806 yrs  
(b) 230 yrs  
(c) 2,346 yrs  
(d) 640 yrs

## PAGE 125

1.  
(a)  $l = 4\text{cm}$   
 $w = 3\text{cm}$   
 $a = 12\text{cm}^2$   
 $p = 14\text{cm}$
- (b)  $l = 5\text{cm}$   
 $w = 2\text{cm}$   
 $a = 10\text{cm}^2$   
 $p = 14\text{cm}$

- (c)  $l = 3\text{cm}$   
 $w = 7\text{cm}$   
 $a = 21\text{cm}^2$   
 $p = 20\text{cm}$

- (d)  $l = 2\text{cm}$   
 $w = 3\text{cm}$   
 $a = 6\text{cm}^2$   
 $p = 10\text{cm}$

1.  
(a) (i)  $21\text{cm}^2$   
(ii)  $20\text{cm}$

- (b) (i)  $30\text{cm}^2$   
(ii)  $22\text{cm}$

- (c) (i)  $32\text{cm}^2$   
(ii)  $24\text{cm}$

- (d) (i)  $54\text{cm}^2$   
(ii)  $42\text{cm}$

- (e) (i)  $208\text{cm}^2$   
(ii)  $58\text{cm}$

- (f) (i)  $456\text{cm}^2$   
(ii)  $86\text{cm}$

- (g) (i)  $45.5\text{cm}^2$   
(ii)  $33\text{cm}$

- (h) (i)  $136.8\text{cm}^2$   
(ii)  $52.4\text{cm}$

- (i) (i)  $352.8\text{cm}^2$   
(ii)  $91.6\text{cm}$

2.  
(a) (i)  $18\text{cm}$   
(ii)  $8\text{cm}^2$

- (b) (i)  $18\text{cm}$   
(ii)  $20\text{cm}^2$

- (c) (i)  $18\text{cm}$   
(ii)  $18\text{cm}^2$

- (d) (i)  $18\text{cm}$   
(ii)  $14\text{cm}^2$

- (e) Not always!

## PAGE 126

- (a)  $55\text{cm}^2$   
(b)  $58\text{cm}^2$   
(c)  $84\text{cm}^2$   
(d)  $111\text{m}^2$   
(e)  $245\text{m}^2$   
Yes

Challenge: €202.72

## PAGE 127

1.  
(a) 6  
(b)  $9\text{cm}^2$   
(c)  $54\text{cm}^2$

2.  $150\text{cm}^2$

3.  
(a)  $24\text{cm}^2$   
(b)  $96\text{cm}^2$   
(c)  $294\text{cm}^2$   
(d)  $486\text{cm}^2$   
(e)  $37.5\text{cm}^2$

4.  
(a) 6  
(b)  $2 \times 3 = 6\text{cm}^2$   
(c)  $5 \times 3 = 15\text{cm}^2$   
(d)  $2 \times 5 = 10\text{cm}^2$   
(e)  $62\text{cm}^2$

5.  
(a)  $108\text{cm}^2$   
(b)  $166\text{cm}^2$

6.  
(a)  $104\text{cm}^2$   
(b)  $166\text{cm}^2$   
(c)  $48\text{cm}^2$

Challenge: 6cm

## PAGE 128

1.  
(a) 30m;  $36\text{m}^2$   
(b) 28m;  $48\text{m}^2$   
(c) 30m;  $42\text{m}^2$   
(d) 24m;  $27\text{m}^2$

2.  
(a)  $153\text{m}^2$   
(b) 52m

3. €176.15  
4. €915.20  
5. €375.84

**PAGE 129**

- 1.**
- (a) (i)  $2\text{m}^2$   
 (ii)  $8.7\text{m}^2$   
 (iii)  $6.9\text{m}^2$   
 (iv)  $3.86\text{m}^2$   
 (v)  $1.765\text{m}^2$   
 (vi)  $2.349\text{m}^2$
- (b) (i)  $30,000\text{cm}^2$   
 (ii)  $70,000\text{cm}^2$   
 (iii)  $90,000\text{cm}^2$   
 (iv)  $13,000\text{cm}^2$   
 (v)  $26,000\text{cm}^2$   
 (vi)  $64,000\text{cm}^2$   
 (vii)  $39,800\text{cm}^2$   
 (viii)  $76,100\text{cm}^2$
- 2.**
- (a) (i) 3 ares  
 (ii) 7 ares  
 (iii) 1.3 ares  
 (iv) 10 ares  
 (v) 19 ares  
 (vi) 17.4 ares  
 (vii) 28.78 ares  
 (viii) 37.81 ares  
 (ix) 50.85 ares
- (b) (i)  $200\text{m}^2$   
 (ii)  $500\text{m}^2$   
 (iii)  $900\text{m}^2$   
 (iv)  $1,300\text{m}^2$   
 (v)  $2,400\text{m}^2$   
 (vi)  $690\text{m}^2$   
 (vii)  $732\text{m}^2$   
 (viii)  $1,692\text{m}^2$   
 (ix)  $2,073\text{m}^2$
- 3.**
- (a) (i)  $20,000\text{m}^2$   
 (ii)  $60,000\text{m}^2$   
 (iii)  $25,000\text{m}^2$   
 (iv)  $32,600\text{m}^2$   
 (v)  $49,300\text{m}^2$   
 (vi)  $39,760\text{m}^2$
- (b) (i) 2h  
 (ii) 8h  
 (iii) 10h  
 (iv) 11h  
 (v) 19.5h  
 (vi) 23.6h  
 (vii) 28.2h  
 (viii) 29.47h  
 (ix) 37.62h
- (c) (i) 300 ares  
 (ii) 700 ares  
 (iii) 1,400 ares  
 (iv) 420 ares  
 (v) 1930 ares  
 (vi) 2243 ares

**PAGE 130**

- 1.** (i)  $\text{m}^2$ ; (a) (f) (h)  
 (ii) ares (b) (e) (i)  
 (iii) hectares (c) (d) (g) (j)
- 2.**
- (a)  $200\text{m}^2$ , 2 ares  
 (b)  $1500\text{m}^2$ , 15 ares  
 (c)  $1400\text{m}^2$ , 14 ares  
 (d)  $3400\text{m}^2$ , 34 ares  
 (e) 30m, 6 ares  
 (f) 70m;  $1400\text{m}^2$   
 (g) 25m; 7.5 ares  
 (h) 80m;  $3200\text{m}^2$
- 3.**
- (a) (i)  $26,100\text{m}^2$   
 (ii) 261 ares  
 (iii) 2.61h
- (b) (i)  $39,500\text{m}^2$   
 (ii) 395 ares  
 (iii) 3.95h
- (c) (i)  $88,450\text{m}^2$   
 (ii) 884.5 ares  
 (iii) 8,845h
- (d) (i)  $92,900\text{m}^2$   
 (ii) 929 ares  
 (iii) 9.29h

**PAGE 131**

- 1.** 60  
**2.** 27  
**3.** 24  
**4.** 12  
**5.** €154  
**6.** 48  
**7.** 45  
**8.** €4.50  
**9.** €30  
**10.** €99  
**11.** 49  
**12.** 6  
**13.**  $19^\circ\text{C}$   
**14.** 31  
**15.**  $110^\circ$   
**16.** 64  
**17.** 0.306  
**18.** 1.255km  
**19.** 65km/h  
**20.**  $468\text{cm}^2$

**PAGE 132**

- 1.**
- (a) €124.99  
 (b) €3,850  
 (c) €21  
 (d) €4.85
- 2.**
- (a) €60.01  
 (b) €46.50  
 (c) €1.95  
 (d) €87.05  
 (e) €13.75  
 (f) €12.60  
 (g) €2.40  
 (h) €5.10
- 3.**
- (a) €78  
 (b) €24.99  
 (c) €129.50  
 (d) €35.99  
 (e) – €97.01  
 (f) €127.02  
 (g) €235.60  
 (h) €349.49
- 4.**
- (a) €200.50 (profit)  
 (b) €4,749 (profit)
- Challenge:** €99 (loss)
- 
- PAGE 133**
- 1.**
- (a) 25%
- (b) (i) €18  
 (ii)  $\frac{1}{6} - 16\frac{2}{3}\%$
- (c) (i) €10  
 (ii)  $\frac{1}{5} - 20\%$  (loss)
- (d) (i) €3.50  
 (ii)  $\frac{1}{4} - 25\%$
- (e) (i) €3.50  
 (ii)  $\frac{1}{10} - 10\%$
- (f) (i) €3  
 (ii)  $\frac{1}{2} - 50\%$

- 2.**
- (a)  $33\frac{1}{3}\%$   
 (b) 25%  
 (c) 20% (loss)  
 (d) 25%  
 (e) 10%

**Challenge:**  $37\frac{1}{2}\%$  (Profit)

**PAGE 134**

- 1.**
- (a) (i) €64  
 (ii) 25%
- (b) (i) €45  
 (ii) 25% (Loss)
- (c) (i) €49  
 (ii) €70
- (d) (i) €200  
 (ii) €80
- (e) (i) €116  
 (ii) €36
- (f) (i) €200  
 (ii) €32 (loss)
- 2.**
- (a) €60  
 (b) €2.75
- (c) (i) C.P. €4,600  
 (ii) S.P. €5,290

- (d) €84  
 (e) €85

**Challenge:** €5,310

**PAGE 135**

- 1.**
- (a) 50%  
 (b) 30  
 (c) 48c  
 (d) 30c (20%)  
 (e) €1.35  
 (f) €1.11

2.  
 (a) €250  
 (b) €450  
 (c) €102  
 (d) €300  
 (e) Skateboard  
 (f) 28%

Challenge: (a) €25  
 (b) €445

PAGE 136

1.  
 (a) €1.50  
 (b) €13.50  
 (c) 50c  
 (d)  $66\frac{2}{3}\%$   
 (e) €29.25  
 (f) €5.25

2.  
 (a) €500  
 (b) 40%  
 (c) €775  
 (d) €332

- (e) (i) x-box  
 (ii) €18.32

- (f) €524  
 (g) €1,650

Challenge:  $16\frac{2}{3}\%$

PAGE 137

1.  
 (a) 98  
 (b) 0.32  
 (c) 1,600  
 (d) 154  
 (e) 40%  
 (f) 15  
 (g) 140  
 (h) 7.9%

2.  
 (a) (i) 30%  
 (ii)  $\frac{7}{20}$   
 (iii) 15%

- (b) (i) 30%  
 (ii)  $\frac{2}{5}$   
 (iii) 0.22

3. T=9.33  
 A = 7.72  
 C = 8.39  
 P = 9.55  
 I = 10.50  
 N = 10.89  
 O = 8.40  
 A = 10.00  
 O = 9.45  
 F = 9.50  
 A = 9.00  
 T = 12

A COAT OF PAINT

4.  
 (a) (i) 80  
 (ii) 60  
 (iii) 12  
 (iv) 18  
 (v) 30  
 (vi) 40

- (b)  $66\frac{2}{3}\%$   
 (c) 40.83%

Challenge: €11.25

PAGE 138

1.  
 (a) + x  
 (b) x -

2.  
 (a)  $25\text{cm}^2$   
 (b)  $49\text{cm}^2$   
 (c)  $81\text{cm}^2$   
 (d)  $36\text{cm}^2$   
 (e)  $121\text{cm}^2$

3.  
 (a) 4cm  
 (b) 8cm  
 (c) 12cm  
 (d) 20cm  
 (e) 30cm

4.  
 (a) 8  
 (b) 27  
 (c) 64  
 (d) 125  
 (e) 216  
 (f) 343  
 (g) 512  
 (h) 729  
 (i) 1000

5.  
 (a) 16  
 (b) 81  
 (c) 625  
 (d) 1,296  
 (e) 10,000  
 (f) 32  
 (g) 243  
 (h) 100,000

6.  
 (a) (i) A C D F G  
 (ii) B C D E  
 (iii) C D  
 (iv) A F G  
 (v) B E  
 (vi) H J  
 (b) (i) 5 6 7 8 9 Z  
 (ii) 2 5 6 9 X Y  
 (iii) 3 4 5 6 Y Z  
 (iv) 6 5  
 (v) 9  
 (vi) Y

- (c) (i) 11  
 (ii) 32  
 (iii) 27  
 (iv) 26  
 (v) 18  
 (vi) 28

7. (i) €528  
 (ii) €336

Challenge: Audrey: 7  
 Ben: 3

PAGE 139

1.  
 (a) 

17	3	4	14	
6	12	11	9	
10	8	7	13	
5	15	16	2	38

- (b) 

16	11	15	4	
6	13	9	18	
5	14	10	17	
19	8	12	7	46

- (c) 

12	11	5	24	18	
19	13	7	6	25	
26	20	14	8	2	
3	22	21	15	9	
10	4	23	17	16	70

2. 96

3.  
 (a) 87  
 (b) 68  
 (c) 55  
 (d) 96  
 (e) 651  
 (f) 80

4. 9,264  
 5. No answers

PAGE 140

- A.  
 (a) Super Savers  
 (b) €8  
 (c) Value Town  
 (d) €5

- (e) (i) €3.75  
 (ii) €3.50  
 (iii) €2.75

(f) Super Prices

- B.  
 (a) (i) €600  
 (ii) €660  
 (iii) €648  
 (iv) Speed Net

(b) No; 'Home Entertainment', as all deals stay in place!

(c) to get you to sign up; to make you think it's the best deal....

- C.  
 (a) 50%  
 (b)  $33\frac{1}{3}\%$   
 (c) 20%  
 (d) 25%

PAGE 141

1.  
 (a) Television €350.00  
 VAT 23% €80.50  
 €430.50

- (b) Bananas €1.37  
 VAT 0% €0.00  
 €1.37



(c) Book	€11.99
VAT 0%	€0.00
	€11.99
(d) Coffee	€6.00
VAT 13%	€0.78
	€6.78
(e) Microwave	€100
VAT 23%	€23.00
	€123.00
(f) Cola	€2.00
VAT 23%	€0.46
	€2.46

- 2.
- (a) €56.50  
(b) €0.78  
(c) €23.73  
(d) €30.51  
(e) €3.65  
(f) €41.82  
(g) €13.68  
(h) €170.67  
(i) €29.33

Challenge: 85.34%

#### PAGE 142

1. €7,420  
2. €1,942.50  
3. €786.60  
4. €106.25  
5. €65.50
- 6.
- (a) (i) €378  
(ii) €63  
(b) (i) €234.90  
(ii) €39.15  
(c) (i) €351  
(ii) €58.50  
(d) (i) €343.20  
(ii) €57.20  
(e) (i) €735.30  
(ii) €122.55  
(f) (i) €826.20  
(ii) €137.70
7. €1,940.54

Challenge I: €45

Challenge II: €171.30

#### PAGE 143

1. (i) Eurozone – euro  
(ii) USA – US Dollars  
(iii) Australia – Australian Dollar  
(iv) South Africa – Rand  
(v) UK – Sterling  
(vi) Denmark – Danish Krone  
(vii) Switzerland – Swiss Franc (CHF)  
(viii) Japan – Yen (Y)
2. €1, because it takes US\$1.25 to equal €1
3. £1, because it takes only 78 UK pennies to equal €1
4. £1; 1 euro; 1 CHF; 1US\$; 1Aus\$; 1Kr; 1 Rand; 1Y
- 5.
- (a) US\$62.50  
(b) €7.18  
(c) Y1,430.20  
(d) €128.20  
(e) €24.54  
(f) CHF59.89  
(g) €137.93  
(h) Kr736.56
- 6.
- (a) €12.40  
(b) €200  
(c) €16.80  
(d) €49.99 (rounded)  
(e) €37.93  
(f) €100  
(g) €369.25  
(h) €123.96  
(i) €16.87  
(j) €24.36  
(k) €110.23  
(l) €150
- 7.
- (a) €29.50  
(b) €1.77  
(c) €20.27  
(d) €6.52 (rounded)  
(e) €1.21 (rounded)  
(f) €1.44 (rounded)  
(g) €0.76 (rounded)

Total: €61.46 (can allow for slight differences here!)

#### PAGE 144

- 1.
- (a) €1,120  
(b) €183.75  
(c) €218.75  
(d) €35  
(e) €87.50  
(f) €105

2.

#### Date: 3rd Jan

Salary  
Amt: + €1,145.50  
Bal: + 695.50

Gas Bill  
Amt: – €218.75  
Bal: + 476.75

Phone Bill  
Amt: – €105.00  
Bal: + 371.75

#### Date: 5th Jan

US\$ 120  
Amt: + €96.00  
Bal: + €467.75

TV and Broadband  
Amt: – €87.50  
Bal: + €380.25

#### Date: 9th Jan

Mortgage  
Amt: – €1,120  
Bal: – €739.75

Electricity  
Amt: – €183.75  
Bal: – €923.50

Bin charges  
Amt: – €35  
Bal: – €958.50

#### Date: 11th Jan

Fridge  
Amt: – €204.75  
Bal: – €1,163.25

#### Date: 12th Jan

Salary  
Amt: + €1,100  
Bal: – €63.25

Chicken  
Amt: – €8.97  
Bal: – €72.22

Supermarket  
Amt: – €147.95  
Bal: – €220.17

#### Date: 14th Jan

Salary  
Amt: + €1,095  
Bal: + €874.83

#### Restaurant

Amt: – €108  
Bal: + €766.83

#### Date: 16th Jan

Console  
Amt: – €244.77  
Bal: + €522.06

#### Date: 20th Jan

Washing Machine  
Amt: – €265  
Bal: + €257.06

#### Cash

Amt: – €350  
Bal: – €92.94

#### Date: 26th Jan

House Insurance  
Amt: – €330  
Bal: – €422.94

#### Date: 31st Jan

Closing Bal: – €422.94

#### PAGE 145

- 1.
- (a) €106  
(b) €124.20  
(c) €200.09  
(d) €204.00  
Total: €634.29
- 2.
- (a) €240  
(b) €386.25
3. 22.22% (<sup>2</sup>/<sub>9</sub>)
4. €4,000

5. 225 skateboards;  
100 snowboards

6. €136.36

7.

(a) (i) €9.60  
(ii) €8  
(iii) €9.72

(b) (i) €10.80  
(ii) €8.10  
(iii) €11.66

8. (i) €14.74  
(ii) 22.83%

**Challenge:** €24.68 (rounded)

**PAGE 146**

- 1.**  
**(a)** centre  
**(b)** diameter  
**(c)** circumference  
**(d)** radius  
**(e)** sector  
**(f)** arc
- 2.**  
**(a)** circumference  
**(b)** radius  
**(c)** diameter
- 3.**  
**(a)** 2cm  
**(b)** radius  
**(c)** all of equal length

- 4.**  
**(a)** 1, 4  
**(b)** 4, 7  
**(c)** 7, 4  
**(d)** 4, 1  
**(e)** 7, 2  
**(f)** 5, 4  
**(g)** 7, 6  
**(h)** 9, 4

- 5.** A: 6cm  
 B: 12cm  
 C: 31.5cm  
 D: 34.4cm  
 E: 32.6cm  
 F: 28.64cm

- 6.**  
**(a)** 100°  
**(b)** 90°  
**(c)** 120°  
**(d)** 50°

**PAGE 147**

- 1.** No answers  
**2.** No answers  
**3.** No answers  
**4.** No answers

- 5.**  
**(a)** 234cm or 2.34m  
**(b)** 78cm  
**(c)** 18252cm<sup>2</sup> or 1.8252m<sup>2</sup>

**Challenge:** No answers

**PAGE 148**

- 1.**  
**(a)** 75.36cm  
**(b)** 59.66cm  
**(c)** 28.26cm  
**(d)** 119.32cm  
**(e)** 254.34cm
- 2.**  
**(a)** 14cm; 43.96cm  
**(b)** 9cm; 56.52cm  
**(c)** 9cm; 28.26cm  
**(d)** 23cm; 144.44cm  
**(e)** 71cm; 222.94cm  
**(f)** 28cm; 175.84cm  
**(g)** 2.5cm; 5cm  
**(h)** 4.25cm; 8.5cm

- 3.**  
**(a)** 81.64cm  
**(b)** 164.48cm  
**(c)** 106.52m  
**(d)** 779.8cm or 7.798m

**PAGE 149**

- 1.**  
**(a)** 16cm<sup>2</sup>  
**(b)** 4cm<sup>2</sup>  
**(c)** 32cm<sup>2</sup>  
**(d)** 28/32cm<sup>2</sup>
- 2.**  
**(a)** (i) 64cm<sup>2</sup>  
 (ii) 48cm<sup>2</sup>  
**(b)** (i) 36cm<sup>2</sup>  
 (ii) 27cm<sup>2</sup>  
**(c)** (i) 100cm<sup>2</sup>  
 (ii) 75cm<sup>2</sup>  
**(d)** (i) 529cm<sup>2</sup>  
 (ii) 396.75cm<sup>2</sup>
- 3.**  
**(a)** 36.75cm<sup>2</sup>  
**(b)** 3cm<sup>2</sup>  
**(c)** 90.75cm<sup>2</sup>

- (d)** 30.72cm<sup>2</sup>  
**(e)** 69.12cm<sup>2</sup>  
**(f)** 2,523cm<sup>2</sup>

- 4.**  
**(a)** 60.75cm<sup>2</sup>  
**(b)** 300cm<sup>2</sup>  
**(c)** 675cm<sup>2</sup>  
**(d)** 43.32cm<sup>2</sup>  
**(e)** 270.75cm<sup>2</sup>  
**(f)** 2,352cm<sup>2</sup>

- 5.**  
**(a)** 75cm<sup>2</sup>  
**(b)** 468.75cm<sup>2</sup>  
**(c)** 972cm<sup>2</sup>  
**(d)** 1,200cm<sup>2</sup>  
**(e)** 1,875cm<sup>2</sup>  
**(f)** 108m<sup>2</sup>  
**(g)** 192m<sup>2</sup>  
**(h)** 34.68m<sup>2</sup>  
**(i)** 159.87m<sup>2</sup>  
**(j)** 253.92m<sup>2</sup>

**PAGE 150**

- 1.**  
**(a)** 200.96cm; 4,096cm<sup>2</sup>; 3,072cm<sup>2</sup>  
**(b)** 251.2cm; 6,400cm<sup>2</sup>; 4,800cm<sup>2</sup>  
**(c)** 113.04cm; 1,296cm<sup>2</sup>; 972cm<sup>2</sup>  
**(d)** 138.16cm; 1,936cm<sup>2</sup>; 1,452cm<sup>2</sup>  
**(e)** 23.864cm; 57.76cm<sup>2</sup>; 43.32cm<sup>2</sup>
- 2.** 24.12m  
**3.** 37.68m  
**4.** 20.51m  
**5.** 2.32m<sup>2</sup>

**Challenge:** (a) 7,776cm<sup>2</sup>  
 (b) 1,944cm<sup>2</sup>

**PAGE 151**

- 1.** 13, 21, 34, 55, 89  
**2.**  
**(a)** 16, 26, 42  
**(b)** 32, 52, 84  
**(c)** 56, 91, 147  
**(d)** 72, 117, 189

- (e)** 96, 156, 252  
**(f)** 120, 195, 315

- 3.**  
**(a)** 1, 1, 2, 3, 5, 8, 13  
**(b)** Yes  
**(c)** No answers  
**(d)** No answers

- 4.**  
**(a)** 15, 21, 28, 36, 45, 55, 66, 78,  
**(b)** 91  
**(c)** 210

**PAGE 152**

- 1.**  
**(a)** Yes  
**(b)** No  
**(c)** Yes  
**(d)** No  
**(e)** Yes  
**(f)** No  
**(g)** Yes  
**(h)** Yes  
**(i)** No  
**(j)** Yes
- 2.** No answers  
**3.** 36, 49, 64  
**4.** 13, 17, 19
- 5.**  
**(a)** 18, 21, 24  
**(b)** 24, 28, 32  
**(c)** 30, 35, 40  
**(d)** 36, 42, 48  
**(e)** 42, 49, 56  
**(f)** 48, 56, 64  
**(g)** 54, 63, 72  
**(h)** 60, 70, 80  
**(i)** 66, 77, 88  
**(j)** 72, 84, 96

- 6.**  
**(a)** 43, 40, 37  
**(b)** 34, 30, 26  
**(c)** 45, 39, 33  
**(d)** 53, 46, 39  
**(e)** 57, 48, 39  
**(f)** 49, 37, 25  
**(g)** 165, 150, 135  
**(h)** 120, 106, 92

**PAGE 153**

- 1.**  
 (a) 17, 23, 30, 38  
 (b) 34, 46, 60, 76  
 (c) 18, 24, 31, 39  
 (d) 31, 25, 18, 10  
 (e) 48, 36, 22, 6  
 (f) 72, 61, 48, 33  
 (g) 50, 68, 89, 113  
 (h) 67, 91, 119, 151

- 2.**  
 (a) 2·9, 3·1, 3·3, 3·5  
 (b) 5·5, 5·8, 6·1, 6·4  
 (c) 8·4, 8·9, 9·4, 9·9  
 (d) 11·0, 11·6, 12·2, 12·8  
 (e) 22·0, 23·2, 24·4, 25·6  
 (f) 35·7, 38·3, 40·9, 43·5  
 (g) 55·9, 59·2, 62·5, 65·8  
 (h) 79·2, 74·7, 70·2, 65·7

- 3.**  
 (a)  $\frac{32}{48}, \frac{64}{96}, \frac{128}{192}, \frac{256}{384}$   
 (b)  $\frac{16}{64}, \frac{32}{128}, \frac{64}{256}, \frac{128}{512}$   
 (c)  $\frac{15}{25}, \frac{18}{30}, \frac{21}{35}, \frac{24}{40}$   
 (d)  $\frac{15}{10}, \frac{18}{12}, \frac{21}{14}, \frac{24}{16}$   
 (e)  $\frac{45}{50}, \frac{54}{60}, \frac{63}{70}, \frac{72}{80}$   
 (f)  $\frac{35}{45}, \frac{42}{54}, \frac{49}{63}, \frac{56}{72}$   
 (g)  $\frac{35}{40}, \frac{42}{48}, \frac{49}{56}, \frac{56}{64}$   
 (h)  $\frac{30}{55}, \frac{36}{66}, \frac{42}{77}, \frac{48}{88}$

- 4.**  
 (a) 39, 51  
 (b) 40, 48, 52  
 (c) 30, 36, 60  
 (d) 80, 72, 64  
 (e) 127, 123, 111  
 (f) 242, 236, 233  
 (g) 450, 465, 510  
 (h) 555, 537, 528  
 (i) 862, 848  
 (j) 960, 982

**Challenge:** (a) 14, 18, 17, 21  
 (b) 21, 17, 23, 19  
 (c) 22, 18, 21, 17

**PAGE 154**

- 1.**  
 (a) 16  
 (b) 16  
 (c) 16

- (d) 32  
 (e) 32  
 (f) 32  
 (g) 75  
 (h) 75  
 (i) 75  
 (j) 72  
 (k) 72  
 (l) 72

- 2.**  
 (a) 43  
 (b) 25  
 (c) 8  
 (d) 6  
 (e) 12  
 (f) 28  
 (g) 30  
 (h) 50  
 (i) 27  
 (j) 37  
 (k) 107  
 (l) 111

- 3.**  
 (a) 23  
 (b) 38  
 (c) 27  
 (d) 60  
 (e) 69  
 (f) 47  
 (g) 65  
 (h) 15  
 (i) 43  
 (j) 49  
 (k) 45  
 (l) 92

- 4.**  
 (a) 21  
 (b) 12  
 (c) 35  
 (d) 56  
 (e) 66  
 (f) 189  
 (g) 175  
 (h) 112  
 (i) 69  
 (j) 276  
 (k) 210  
 (l) 132

**PAGE 155**

- 1.**  
 (a) 27  
 (b) 4  
 (c) 6  
 (d) 44  
 (e) 1  
 (f) 24  
 (g) 16  
 (h) 10  
 (i) 6  
 (j) 12  
 (k) 16  
 (l) 6

- 2.**  
 (a) 12  
 (b) 1  
 (c) 12  
 (d) 6  
 (e) 17  
 (f) 18  
 (g) 11  
 (h) 12  
 (i) 15

- 3.**  
 (a) 147  
 (b) 54  
 (c) 36  
 (d) 71  
 (e) 22  
 (f) 27  
 (g) 49  
 (h) 26

- 4.**  
 (a) 50  
 (b) 38  
 (c) 60  
 (d) 19  
 (e) 29  
 (f) 98·4  
 (g) 14  
 (h) 48  
 (i) 45·7  
 (j) 19·7  
 (k) 49  
 (l) 10  
 (m) 37·8  
 (n) 212  
 (o) 43  
 (p) 6

- 5.** -, x, €1,000  
**6.** ÷, x, -, €430

**PAGE 156**

- 1.** €28 + €150 - (€20 x 2) = €138  
**2.** €148 - (2 x €29) - 54 = €36  
**3.** €125 - €40 - €54 - €20 = €11  
**4.** €196 - €15 + €20 - €48 - €29 = €124  
**5.** 148 ÷ 4 x 3 - 36 = €75  
**6.** 237 - 36 - 36 - 48 = €117  
**7.** €460 - €48 - €48 - (3 x €29) = €304  
**8.** €580 - (3 x €20) - (4 x €36) + €36 = €412  
**9.**  
 (a) (€240 ÷ 20) = 12 t-shirts  
 (b) €180 ÷ 36 = 5 dresses  
**10.** €600 - (8 x €29) - (7 x €48) - €15 = €17  
**11.** €300 - (€48 ÷ 5 x 4) x 7 = €31·20

**Challenge:** €370

**PAGE 157**

- 1.** 200cm<sup>2</sup>  
**2.** 1·32  
**3.** 0·024  
**4.** €60  
**5.** €48  
**6.** 20%  
**7.** 2,000,000  
**8.** 2,400  
**9.** €25  
**10.** 52°C  
**11.** €7·20  
**12.** €5·60  
**13.** €12·30  
**14.** €565

15. €642  
 16. US\$1,000  
 17. 45  
 18. 50  
 19.  $\frac{4}{15}$   
 20.  $45^\circ$

## PAGE 158

1. (b)  $120^\circ$ ,  $\frac{1}{3}$ , 12  
 (c)  $60^\circ$ ,  $\frac{1}{6}$ , 6  
 (d)  $30^\circ$ ,  $\frac{1}{12}$ , 3

2.  
 (a)  $180^\circ$ ,  $\frac{1}{2}$ , 39  
 (b)  $60^\circ$ ,  $\frac{1}{6}$ , 13  
 (c)  $120^\circ$ ,  $\frac{1}{3}$ , 26

3.  
 (a)  $45^\circ$ ,  $\frac{1}{8}$ , 13  
 (b)  $225^\circ$ ,  $\frac{5}{8}$ , 65  
 (c)  $90^\circ$ ,  $\frac{1}{4}$ , 26

4.  
 (a)  $108^\circ$ ,  $\frac{3}{10}$ , 36  
 (b)  $72^\circ$ ,  $\frac{1}{5}$ , 24  
 (c)  $120^\circ$ ,  $\frac{1}{3}$ , 40  
 (d)  $60^\circ$ ,  $\frac{1}{6}$ , 20

5.  
 (a)  $30^\circ$ ,  $\frac{1}{12}$ , 12  
 (b)  $90^\circ$ ,  $\frac{1}{4}$ , 36  
 (c)  $135^\circ$ ,  $\frac{3}{8}$ , 54  
 (d)  $45^\circ$ ,  $\frac{1}{8}$ , 18  
 (e)  $60^\circ$ ,  $\frac{1}{6}$ , 24

## PAGE 159

1.  
 (a) (i)  $72^\circ$ ,  $\frac{1}{5}$   
 (ii)  $108^\circ$ ,  $\frac{3}{10}$   
 (iii)  $144^\circ$ ,  $\frac{2}{5}$   
 (iv)  $36^\circ$ ,  $\frac{1}{10}$

(b) No answers

- (c) (i)  $20^\circ$   
 (ii) 30%  
 (iii) 40%  
 (iv) 10%

(d)  $108^\circ$

## Challenge:

- blue: 27  $\frac{3}{8}$   $135^\circ$   
 brown: 24  $\frac{1}{3}$   $120^\circ$   
 green: 6  $\frac{1}{12}$   $30^\circ$   
 hazel: 9  $\frac{1}{8}$   $45^\circ$   
 grey: 6  $\frac{1}{12}$   $30^\circ$

(ii) No answers

## PAGE 160

1.  
 (a) No answers

- (b) (i) 120  
 (ii) 108

- (c) 24  
 (d) Fri/Sat  
 (e) 21-6  
 (f) Thurs/Fri/Sat  
 (g) 27

2.  
 (a) (i)  $\frac{1}{12}$ ,  $\frac{1}{6}$ ,  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  
 $30^\circ$   $60^\circ$   $45^\circ$   $90^\circ$   $135^\circ$   
 (ii)  $\frac{5}{12}$   $\frac{1}{4}$   $\frac{1}{6}$   $\frac{1}{12}$   $\frac{1}{12}$   
 $150^\circ$   $90^\circ$   $60^\circ$   $30^\circ$   $30^\circ$

(b) No answers

## PAGE 161

3.  
 (a) No answers  
 (b) Wed/Fri/Sat  
 (c) Thurs  
 (d) Wed/Thurs/Fri  
 (e) Less  
 (f) No; demand increasing  
 (g) the average daily sales  
 (h) dotted red line at 22

4.  
 (a) (i) €3-52  
 (ii) €1-25  
 (b) €135  
 (c) €75-30

Challenge: (i) 33  $\frac{1}{3}\%$   
 (ii) 20%

## PAGE 162

1.  
 (a) B  
 (b) C  
 (c) E  
 (d) E  
 (e) A  
 (f) D  
 (g) A  
 (h) C  
 (i) A

2. No answers  
 3. No answers

Challenge: 6,600 tones

## PAGE 163

1.  
 (a) 1-65kg  
 (b) 1-8kg  
 (c) 2-37kg  
 (d) 5-075kg  
 (e) 3-005kg

2.  
 (a) 4-45kg  
 (b) 0-445kg  
 (c) 0-045kg  
 (d) 0-005kg  
 (e) 0-7kg

3.  
 (a) 3,625g  
 (b) 5,700g  
 (c) 1,085g  
 (d) 2,060g
4.  
 (a) 3,250g  
 (b) 6,700g  
 (c) 2-030g  
 (d) 3,375g

5.  
 (a) 1,47t  
 (b) 2-26t  
 (c) 1-7t  
 (d) 3-025t

6.  
 (a) 0-77t  
 (b) 0-095t  
 (c) 0-008t  
 (d) 0-3t

7.  
 (a) 1-84t  
 (b) 5-3t  
 (c) 6-09t  
 (d) 3-008t

8.  
 (a) 5-9t  
 (b) 3-75t  
 (c) 6-6t  
 (d) 4-57t

9.  
 (a)  $\frac{3}{4}$ kg  
 (b)  $\frac{3}{5}$ kg  
 (c)  $\frac{3}{8}$ kg  
 (d)  $\frac{9}{10}$ kg

10.  
 (a)  $\frac{7}{10}$ t  
 (b)  $\frac{2}{5}$ t  
 (c)  $\frac{13}{20}$ t  
 (d)  $\frac{9}{25}$ t

11.  
 (a)  $\frac{3}{500}$ t  
 (b)  $\frac{1}{20}$ t  
 (c)  $\frac{13}{20}$ t  
 (d)  $\frac{3}{20}$ t

12.  
 (a)  $\frac{51}{100}$ t  
 (b)  $\frac{7}{8}$ t  
 (c)  $\frac{7}{40}$ t  
 (d)  $\frac{3}{40}$ t

Challenge: (a) 3-6t  
 (b) 3  $\frac{3}{5}$ t

## PAGE 164

1.  
 (a) 39-496kg  
 (b) 123-352kg  
 (c) 316-26kg  
 (d) 70-1384kg  
 (e) 307-36kg

- 2.**  
**(a)** 0.528t  
**(b)** 0.385t  
**(c)** 0.276t  
**(d)** 0.163t  
**(e)** 2.87t
- 3.**  
**(a)** 53.958kg  
**(b)** 33.516kg  
**(c)** 462.944kg  
**(d)** 2.699kg  
**(e)** 4.765kg  
**(f)** 0.246t
- 4.**  
**(a)** (i) 5.273kg;  $5\frac{2}{5}$ kg; 5,550kg  
(ii) 0.227kg  
**(b)** (i) 1.186g, 1kg, 279g, 1.45kg  
(ii) 0.264kg  
**(c)** (i) 603g, 6,003g, 6.03kg  
(ii) 5.427kg  
**(d)** (i) 7,127g,  $7\frac{3}{8}$ kg, 7.72kg  
(ii) 0.593kg  
**(e)** (i)  $\frac{3}{4}$ kg, 0.867kg, 876g  
(ii) 0.126kg  
**(f)** (i)  $4\frac{3}{5}$ kg,  $4\frac{5}{8}$ kg, 4,650g  
(ii) 0.05kg
- 5.**  
**(a)** 648.5g  
**(b)** 553.5g  
**(c)** 693.5g  
**(d)** 17.510kg  
**(e)** 882.5g/0.8825kg  
**(f)** 15.564kg  
**Challenge 1:** 0.085kg  
**Challenge 2:** 2.04kg
- 
- PAGE 165**  
**1.**  
**(a)** €2.50  
**(b)** €16.50  
**(c)** €10.70  
**(d)** €4.80  
**(e)** €5.40  
**(f)** €7.80

- 2.**  
A €19.02;  
B €17.69;  
C €15.59;  
D €10.19;  
E €29.73
- 3.**  
**(a)** 125g  
**(b)** 1,250g  
**(c)** 625g  
**(d)** 350g  
**(e)** 2,450g  
**(f)** 1,150g
- 4.**  
**(a)** 200g  
**(b)** 1500g  
**(c)** 800g  
**(d)** 2100g  
**(e)** 1,200g  
**(f)** 3,500g  
**(g)** 8,250g  
**(h)** 13,500g  
**(i)** 8,800g  
**Challenge:** 1,000t
- 
- PAGE 166**  
**1.**  
**(a)** (iii) 156g  
(iv) 285g  
**(b)** (i) 212.5g  
(ii) 300g  
(iii) 342g  
**(c)** (i) 425g  
(ii) 547.5g  
(iii) 608.4g  
(iv) 193.8g
- 2.**  
**(a)** (i) €48  
(iii) €132  
(iv) €86  
(v) €34  
**(b)** (i) €27  
(ii) €58  
(iii) €136  
(iv) €19.50  
(v) €10.60

- (c)** (i) €13.70  
(ii) €22.80  
(iii) €145  
(iv) €110  
(v) €36
- 3.**  
**(a)** 43.7g  
**(b)** 27.9g  
**(c)** 22g  
**(d)** 45.4g  
**(e)** 59.8g  
**(f)** 93.1g
- 4.**  
**(a)** (i) €1.80  
(ii) 25.1g  
**(b)** (i) €2.60  
(ii) 20.4g  
**(c)** (i) €4.50  
(ii) 24.8g  
**(d)** (i) €2.10  
(ii) 12.6g  
**(e)** (i) €3.70  
(ii) 29.5g  
**(f)** (i) €4.30  
(ii) 26.8g
- Challenge:** 8
- 
- PAGE 167**  
**1.** €50
- 2.**  
**(a)** €45  
**(b)** €5
- 3.**  
**(a)** 3,264g  
**(b)** 3.264kg
- 4.** 15.504kg  
**5.** €78.66  
**6.** 86,400g  
**7.** 162kg  
**8.** 720
- 9.**  
**(a)** 9.72 tonnes  
**(b)** €938.25

- 10.**  
**(a)** 2,240kg  
**(b)** 2,250.4l  
**Challenge:** 16.56 tonnes
- 
- PAGE 168**  
**1.** Solid  
**2.** Length, width, height  
**3.** Vertex  
**4.** Base  
**5.** Apex  
**6.** Shape of bases  
**7.** Tetrahedron  
**8.** Prism  
**9.** Cylinder  
**10.** Polyhedral  
**11.** Polyhedron  
**12.** Shape net
- 
- PAGE 169**  
**1.**  
**(a) Cuboid:**  
faces: 6  
edges: 12  
vertices: 8  
meet: 3  
**(b) tetrahedron:**  
faces: 4  
edges: 6  
vertices: 4  
meet: 3  
**(c) pentagonal prism:**  
faces: 7  
edges: 15  
vertices: 10  
meet: 3  
**(d) cube:**  
faces: 6  
edges: 12  
vertices: 8  
meet: 3  
**(e) triangular prism:**  
faces: 5  
edges: 9  
vertices: 6  
meet: 3  
**(f) hexagonal pyramid:**  
faces: 7  
edges: 12  
vertices: 7  
meet: (i) 6; (ii) 3

- 2.**  
**(a)** cube  
**(b)** hexagonal pyramid  
**(c)** pentagonal prism  
**(d)** cuboid  
**(e)** triangular prism  
**(f)** tetrahedron

**Challenge I:** No! (sides not straight)

**Challenge II:** Cone, cylinder, sphere, hemisphere

## PAGE 170

- 1.**  
**(a)** triangular pyramid  
**(b)** 6  
**(c)** 4  
**(d)** triangle  
**(e)** 4

- 2.**  
**(a)** 12  
**(b)** 6  
**(c)** square  
**(d)** 8  
**(e)** prism

- 3.**  
**(a)** 12  
**(b)** 8  
**(c)** triangle  
**(d)** 6  
**(e)** square pyramids

**Challenge:**  
**(a)** (i) 12 (ii) 30 (iii) 20  
**(b)** (i) 20 (ii) 30 (iii) 12

## PAGE 171

- 1.**  
**(a)** (i)  
**(b)** (iii)  
**(c)** (i)  
**(d)** (ii)
- 2.**  
**(a)** (i) Top  
(ii) side  
(iii) front  
**(b)** (i) front  
(ii) side  
(iii) top

- (c)** (i) top  
(ii) side  
(iii) front  
**(d)** (i) side  
(ii) top  
(iii) front

- 3.**  
**(a)** top  
**(b)** front  
**(c)** side  
**(d)** top

## PAGE 172

- 1.**  
**(a)** 1L  
**(b)** 250ml  
**(c)** 5L  
**(d)** 300ml  
**(e)** 20,000ml  
**(f)** 280ml

- 2.**  
**(a)** 10L  
**(b)** 50ml  
**(c)** 10ml  
**(d)** 2L  
**(e)** 20,000l  
**(f)** 500ml

**Challenge:** 300L

## PAGE 173

- 1.**  
**(a)** (i)  $\frac{9}{20}$ l  
(ii) 0.45l  
**(b)** (i)  $2\frac{452}{1000}$ l  
(ii) 2.452l  
**(c)** (i)  $\frac{6}{10}$ l or  $\frac{3}{5}$ l  
(ii) 0.6l  
**(d)** (i)  $1\frac{782}{1000}$ l  
(ii) 1.782l  
**(e)** (i)  $\frac{95}{1000}$ l or  $\frac{19}{200}$ l  
(ii) 0.095l  
**(f)** (i)  $\frac{395}{1000}$ l or  $\frac{79}{200}$ l  
(ii) 0.395l  
**(g)** (i)  $\frac{7}{1000}$ l  
(ii) 0.007l  
**(h)** (i)  $\frac{7}{10}$ l  
(ii) 0.7l  
**(i)** (i)  $2\frac{32}{100}$ l  
(ii) 2.230l

- (j)** (i)  $\frac{8}{100}$ l or  $\frac{4}{25}$ l  
(ii) 0.08l  
**(k)** (i)  $1\frac{1}{100}$ l  
(ii) 1.01l  
**(l)** (i)  $\frac{67}{1000}$ l  
(ii) 0.067l

- 2.**  
**(a)** 2,500ml  
**(b)** 763ml  
**(c)** 1,493l  
**(d)** 920ml  
**(e)** 3,250ml  
**(f)** 4,065ml  
**(g)** 5,700ml  
**(h)** 8ml  
**(i)** 307ml  
**(j)** 2,007ml  
**(k)** 80ml  
**(l)** 5,375ml  
**(m)** 400ml  
**(n)** 6,105ml  
**(o)** 2,200ml  
**(p)** 1,125ml  
**(q)** 100ml  
**(r)** 3,750ml

- 3.**  
**(a)** 500ml  
**(b)** 200ml  
**(c)** 250ml  
**(d)** 100ml  
**(e)** 125ml  
**(f)** 600ml  
**(g)** 700ml  
**(h)** 625ml  
**(i)** 750ml  
**(j)** 875ml

- 4.**  
**(a)**  $\frac{1}{2}$  l  
**(b)** 500ml  
**(c)** 350ml  
**(d)** 350ml

- 5.**  
**(a)** (i) 4.8l  
(ii) 28.8l  
(iii) 72l  
**(b)** (i) €33.48  
(ii) €200.88  
(iii) €502.20

- (c)** (i) 16  
(ii) €44.64

**Challenge:** 372

## PAGE 174

- 1.**  
**(a)** 3,628ml  
**(b)** 5,300ml  
**(c)** 7,054ml  
**(d)** 6,150ml  
**(e)** 2,040ml  
**(f)** 1,009ml  
**(g)** 6,300ml  
**(h)** 6,150ml  
**(i)** 2,450ml  
**(j)** 3,072ml  
**(k)** 4,390ml  
**(l)** 5,070ml

- 2.**  
**(a)** 2.762l  
**(b)** 7.62l  
**(c)** 21.609l  
**(d)** 2.964l  
**(e)** 11.61l  
**(f)** 260.974l  
**(g)** 5.845l  
**(h)** 1.52l  
**(i)** 0.374l  
**(j)** 9.406l  
**(k)** 1.568l  
**(l)** 2.875l

- 3.**  
**(a)** (i) 14.907l  
(ii) 0.275l  
**(b)** (i) 19.345l  
(ii) 0.031l  
**(c)** (i) 8.088l  
(ii) 0.008l  
**(d)** (i) 9.048l  
(ii) 0.02l

- 4.**  
**(a)** 357l  
**(b)** €328.44

- 5.** 875ml  
**6.** 24

**Challenge I:** (a) 300km  
(b) €8.40

**Challenge II:** 59 days

**PAGE 175**

- 1.**  
(a) (i) 16  
(ii)  $16\text{cm}^3$   
(b) (i) 12  
(ii)  $12\text{cm}^3$   
(c) (i) 24  
(ii)  $24\text{cm}^3$   
(d) (i) 18  
(ii)  $18\text{cm}^3$
- 2.**  
(a)  $3 \times 4 \times 2 = 24\text{cm}^3$   
(b)  $4 \times 4 \times 5 = 80\text{cm}^3$

- 3.**  
(a)  $12\text{cm}^3$   
(b)  $48\text{cm}^3$   
(c)  $30\text{cm}^3$   
(d)  $64\text{cm}^3$

**PAGE 176**

**1.** No answers

- 2.**  
(a)  $48\text{cm}^3$   
(b)  $40\text{cm}^3$   
(c)  $24\text{cm}^3$

- 3.**  
(a)  $70\text{m}^3$   
(b)  $48\text{m}^3$   
(c)  $72\text{m}^3$   
(d)  $252\text{m}^3$   
(e)  $162\text{m}^3$   
(f)  $156.6\text{m}^3$

- 4.**  
(a)  $21.06\text{m}^3$   
(b)  $10.53\text{m}^3$   
(c)  $442.26\text{m}^3$

- 5.**  
(a)  $73,728\text{m}^3$   
(b)  $31,104\text{m}^3$

**Challenge:**  $17\text{m}^3$

**PAGE 177**

- 1.**  
(a) 4.05l  
(b) €10.40
- 2.**  
(a) Pat: €3.90;  
Mark: €5.20  
(b) Pat
- 3.**  
(a) Tom: 10; €17  
(b) Charlie: 7; €18.20

- 4.**  
(a) 16.15l  
(b) €44.65

- 5.**  
(a) (i) 30  
(ii) 15  
(b) €113.25

- 6.**  
(a) €12.75  
(b) €5.25

- 7.**  
(a) 1.9l  
(b) €11.55

- 8.**  
(a) 1.05l  
(b) €4.40

- 9.**  
(a) Lara: 50  
(b) Emma: 25

**PAGE 178**

- 1.**  
(a) Possible  
(b) possible  
(c) certain  
(d) possible  
(e) impossible  
(f) impossible  
(g) impossible  
(h) possible

- 2.**  
(a), (c), (d)

- 3.**  
(a) possible  
(b) possible  
(c) impossible  
(d) even chance  
(e) certain  
(f) even chance

**PAGE 179**

- 1.**  
(a) 1:6 or  $\frac{1}{6}$   
(b) 1:6 or  $\frac{1}{6}$   
(c) 1:6 or  $\frac{1}{6}$   
(d) no chance ; 0  
(e) 3:6 or  $\frac{1}{2}$   
(f) no chance or 0  
(g) 2:6 or  $\frac{1}{3}$   
(h) 3:6 or  $\frac{1}{2}$

- 2.**  
(a) certain  
(b) even chance  
(c) almost impossible  
(d) even chance  
(e) almost certain  
(f) even chance

**PAGE 180**

- 1.**  
(a) 1 in 5  
(b)  $\frac{1}{5}$   
(c) 3 in 5  
(d)  $\frac{3}{5}$   
(e) No answers
- 2.**  
(a) 1 in 6  
(b)  $\frac{1}{6}$   
(c) 1 in 3  
(d)  $\frac{1}{3}$   
(e) 3:6 or  $\frac{1}{2}$   
(f) 2 in 3  
(g) zero chance/probability

- 3.**  
(a) 1:2 or  $\frac{1}{2}$   
(b) 1:4 or  $\frac{1}{4}$   
(c) 2:3 or  $\frac{2}{3}$   
(d) 1:7 or  $\frac{1}{7}$

**PAGE 181**

No answers

**PAGE 182**

- 1.**  
(b) 1 in 20;  $\frac{1}{20}$ , 0.05, 5%  
(c) 1 in 2;  $\frac{1}{2}$ ; 0.5; 50%  
(d) 1 in 2;  $\frac{1}{2}$ ; 0.5; 50%  
(e) 1 in 5;  $\frac{1}{5}$ ; 0.2; 20%  
(f) 3 in 20;  $\frac{3}{20}$ ; 0.15; 15%  
(g) 1 in 10;  $\frac{1}{10}$ ; 0.1; 10%  
(h) 1 in 2;  $\frac{1}{2}$ ; 0.5; 50%  
(i) 1 in 10;  $\frac{1}{10}$ ; 0.1; 10%  
(j) 3 in 20;  $\frac{3}{20}$ ; 0.15; 15%  
(k) 1 in 5;  $\frac{1}{5}$ ; 0.2; 20%  
(l) 3 in 10;  $\frac{3}{10}$ ; 0.3; 30%

- 2.**  
(b) 2 in 25;  $\frac{2}{25}$ ; 0.08; 8%  
(c) 1 in 25;  $\frac{1}{25}$ ; 0.04; 4%  
(d) 3 in 25;  $\frac{3}{25}$ ; 0.12; 12%  
(e) 8 in 25;  $\frac{8}{25}$ ; 0.32; 32%  
(f) 6 in 25;  $\frac{6}{25}$ ; 0.24; 24%  
(g) 1 in 5;  $\frac{1}{5}$ ; 0.2; 20%  
(h) 11 in 25;  $\frac{11}{25}$ ; 0.44; 44%  
(i) 9 in 25;  $\frac{9}{25}$ ; 0.36; 36%

**PAGE 183**

- 1.** Sector  
**2.** 18.84  
**3.** 31.4cm  
**4.** x  
**5.** 22  
**6.** 15  
**7.**  $\frac{5}{12}$   
**8.** 2,650g  
**9.** 750kg  
**10.** 6.250kg  
**11.** €324  
**12.** Triangular prism  
**13.** 8  
**14.** 750ml  
**15.** 5.038l  
**16.** 90  
**17.**  $27\text{cm}^2$   
**18.** 3:4  
**19.** 11 shots  
**20.** 1 in 2

## PAGE 184

1.  
(answer in 2016 = 45)
2.  $4\frac{1}{3}$  yrs
3. 62
4. (i)  $\frac{11}{120}$   
(ii) 0.09  
(iii) 9%
5.  
(a) \$28.50  
(b) \$104.50
6.  
(a) (i)  $\frac{7}{8}$   
(ii) 0.875  
(iii)  $87\frac{1}{2}$   
(b) Mick: 140;  
min: 148
7.  
(a) 5,000  
(b) (i) 475,000  
(ii) 495,000
8. (i) 2,031  
(ii) 2,046
9.  
(a) (i) 2,600  
(ii) 4,875  
(iii) 2,470  
(b) 23.5%
10. 7,242,000m

## PAGE 185

11. 6,155.7km
12. 9,205
13.  
(a) (i)  $\frac{1}{6}$   
(ii) 0.166  
(iii) 16.66%  
( $16\frac{2}{3}\%$ )  
(b) (i)  $\frac{5}{6}$   
(ii) 0.833  
(iii) 83.33%  
( $83\frac{1}{3}\%$ )
14.  
(a) 42  
(b)  $\frac{1}{2}$ ; 0.5, 50%

15. 5 secs
16. (i) \$116,323  
(ii) \$814,261
17.  
(a) 200mins  
(b) 1:4  
(c) 675mins  
(d) 2hrs 15mins
18. €6,800

## PAGE 186

1. 400,000
2. €40
3. 45
4. 480
5.  $270^\circ$
6.  $\frac{1}{12}, \frac{1}{11}, \frac{1}{9}, \frac{1}{8}$
7.  $60^\circ$
8.  $5\frac{7}{12}$
9.  $3\frac{1}{6}$
10. 400g
11. 13.7
12. 144
13. 6,049ml
14. 42cm
15.  $121\text{cm}^2$
16. 06:00 (Monday)
17. €440
18. €320
19. €150
20. 2,062