

# 16 Number Concepts 4

## 16.1 Multiplying and Dividing by 10 and 100

1. (a) 40 (b) 80 (c) 90 (d) 30 (e) 120 (f) 240  
 (g) 200 (h) 1000 (i) 300 (j) 500 (k) 2000 (l) 4000  
 (m) 7000 (n) 5000 (o) 7000 (p) 500 (q) 700 (r) 900  
 (s) 9000 (t) 50 (u) 200 (v) 200 (w) 140 (x) 1700  
 (y) 100 (z) 0
  
2. (a) 7 (b) 20 (c) 1 (d) 4 (e) 7 (f) 30  
 (g) 9 (h) 5 (i) 80 (j) 40 (k) 8 (l) 10  
 (m) 10 (n) 100 (o) 10 (p) 10 (q) 100 (r) 2  
 (s) 30 (t) 500 (u) 10 (v) 100
  
3. (a) 50 (b) 48 (c) 182 (d) 105 (e) 43 (f) 5  
 (g) 132 (h) 199 (i) 168 (j) 352 (k) 1346 (l) 651  
 (m) 867 (n) 1271 (o) 2640 (p) 1557 (q) 99 (r) 708  
 (s) 1021 (t) 1000
  
4. (a) 30 (b) 4 (c) 50 (d) 60 (e) 100 (f) 7  
 (g) 8 (h) 12 (i) 400 (j) 70 (k) 400 (l) 800  
 (m) 9000 (n) 1000 (o) 100 (p) 20
  
5. (a) 280 (b) 4200 (c) 700 (d) 1240 (e) 940 (f) 2360  
 (g) 510 (h) 2400 (i) 9700 (j) 12 100 (k) 57 400 (l) 94 200  
 (m) 75 800 (n) 1200
  
6. (a) (i) 80p (ii) £8 (800p) (b) (i) 5p (ii) £5 (500p)  
 (c) (i) £1 (ii) £10 (iii) £1000 (d) (i) £2000 (ii) £20 000  
 (e) (i) 1p (ii) 10p (f) (i) £3 (ii) £300 (iii) £150

## 16.2 Addition

1. (a) 47 (b) 79 (c) 89 (d) 99 (e) 31
2. (a) 71 (b) 55 (c) 102 (d) 91 (e) 110
3. (a) 251 (b) 477 (c) 137 (d) 260 (e) 591
4. (a) 741 (b) 860 (c) 990 (d) 177 (e) 801
5. (a) 977 (b) 329 (c) 529 (d) 861 (e) 915

6. (a) 793 (b) 789 (c) 514 (d) 1062 (e) 987
7. (a) 1146 (b) 1179 (c) 1135 (d) 1035 (e) 1185
8. (a)  $17 + 12 = 29$  pieces of fruit (b)  $42 + 74 = 116$  papers  
 (c)  $52 + 52 = 104$  people (d)  $23 + 51 = 74$  points  
 (e)  $124 + 368 = 492$  (f)  $124 + 128 = 252$  houses  
 (g)  $544 + 278 = 822$  runs (h)  $328 + 542 = 870$  people  
 (i)  $148 + 784 = \text{£}932$  (j)  $843 + 428 = 1271$  vehicles  
 (k)  $731 + 572 = 1303$  passengers
9. (a) 109 (b) 106 (c) 164 (d) 54 (e) 215
10. (a) 229 (b) 1095 (c) 1043 (d) 942 (e) 893 (f) 1910  
 (g) 2125 (h) 251 (i) 874 (j) 798 (k) 1253 (l) 1377  
 (m) 1457 (n) 1846 (o) 1406

### 16.3 Subtraction

1. (a) 31 (b) 33 (c) 14 (d) 10 (e) 4
2. (a) 35 (b) 20 (c) 125 (d) 223 (e) 705
3. (a) 56 (b) 47 (c) 36 (d) 89 (e) 57
4. (a) 37 (b) 59 (c) 9 (d) 46 (e) 44
5. (a) 943 (b) 417 (c) 411 (d) 909 (e) 348
6. (a) 324 (b) 73 (c) 209 (d) 429 (e) 236
7. (a) 60 (b) 164 (c) 48 (d) 249 (e) 379
8. (a)  $72 - 29 = 43$  sweets  
 (b)  $144 - 78 = 66$  cans  
 (c)  $58 - 27 = 31$  passengers  
 (d)  $121 - 94 = 27$   
 (e)  $948 - 278 = 670$  leaflets  
 (f)  $371 - 258 = 113$  records  
 (g)  $270 - 97 = 173 \Rightarrow$  no, as  $\text{£}173 < \text{£}180$   
 (h)  $328 - 172 = 156$  runs  
 (i)  $921 - 738 = 183$  people  
 (j)  $373 - 159 = 214$ , i.e.  $\text{£}214$   
 (k)  $700 - 384 = 316$  cars  
 (l)  $734 - 483 = 251$  girls

9. (a) 32 (b) 61 (c) 70 (d) 143 (e) 429 (f) 337  
 (g) 531 (h) 454 (i) 38 (j) 83 (k) 32 (l) 256  
 (m) 288 (n) 577 (o) 865 (p) 141 (q) 512 (r) 169  
 (s) 659 (t) 384 (u) 114 (v) 829 (w) 149 (x) 68

## 16.4 Multiplication

1. (a) 39 (b) 48 (c) 28 (d) 26 (e) 105  
 2. (a) 64 (b) 85 (c) 144 (d) 114 (e) 164  
 3. (a) 368 (b) 357 (c) 189 (d) 98 (e) 432  
 4. (a) 240 (b) 560 (c) 150 (d) 120 (e) 450  
 5. (a) 497 (b) 342 (c) 432 (d) 448 (e) 279  
 6. (a) 644 (b) 688 (c) 756 (d) 539 (e) 882  
 7. (a) 456 (b) 343 (c) 290 (d) 282 (e) 448
8. (a)  $6 \times 72 = 432$  oranges (b)  $8 \times 52 = 416$  passengers  
 (c)  $8 \times 36 = 288$  miles (d)  $9 \times 17 = 153$ , i.e. £153  
 (e)  $36 \times 9 = 324$ , i.e. £3.24 (f)  $8 \times 43 = 344$  cabbages  
 (g)  $5 \times 18 = 90$  bottles (h)  $3 \times 93 = 279$  points  
 (i)  $4 \times 23 = 92$  runs (j)  $6 \times 73 = 438$  points  
 (k)  $7 \times 33 = 231$  miles (l)  $6 \times 22 = 132$  tonnes  
 (m)  $9 \times 428 = 3852$ , i.e. £38.52
9. (a) 42 (b) 84 (c) 76 (d) 170 (e) 189 (f) 364  
 (g) 144 (h) 392 (i) 576 (j) 465 (k) 252 (l) 112  
 (m) 108 (n) 243 (o) 328 (p) 63 (q) 98 (r) 279  
 (s) 288 (t) 250 (u) 175 (v) 891 (w) 234 (x) 616

## 16.5 Division

1. (a) 10 (b) 21 (c) 13 (d) 11 (e) 10  
 2. (a) 9 (b) 5 (c) 4 (d) 6 (e) 9  
 3. (a) 23 (b) 16 (c) 8 (d) 7 (e) 13  
 4. (a) 7 (b) 12 (c) 13 (d) 3 (e) 22  
 5. (a) 21 r 1 (b) 22 r 1 (c) 14 r 2 (d) 14 r 3 (e) 11  
 6. (a) 23 r 1 (b) 8 r 2 (c) 36 r 1 (d) 11 r 6 (e) 23 r 1  
 7. (a) 14 r 1 (b) 15 (c) 6 r 2 (d) 11 r 4 (e) 15 r 4

8. (a)  $21 \div 3 = 7$ , i.e. £7 (b)  $44 \div 4 = 11$  cars  
 (c) (i) 6 (ii) 3 (iii) 4 (d)  $40 \div 5 = 8$  sweets  
 (e)  $45 \div 5 = 9$ , i.e. £9 (f)  $68 \div 9 = 7$  r 5 (i) 7 (ii) 5  
 (g)  $56 \div 8 = 7$ , i.e. £7 (h)  $32 \div 8 = 4$  teams  
 (i) (i) 15 groups (ii) 2 left over (j)  $84 \div 6 = 14$  boxes  
 (k)  $210 \div 7 = 30$  pupils
9. (a) 9 (b) 17 (c) 15 r 2 (d) 28 (e) 14 r 2 (f) 24  
 (g) 17 (h) 19 r 3 (i) 14 r 2 (j) 10 r 7 (k) 9 (l) 18 r 1  
 (m) 13 r 3 (n) 31 r 1 (o) 4 r 1 (p) 6 r 4 (q) 13 r 2 (r) 45  
 (s) 26 (t) 8 r 4 (u) 9 r 4

## 16.6 Calculations in Context

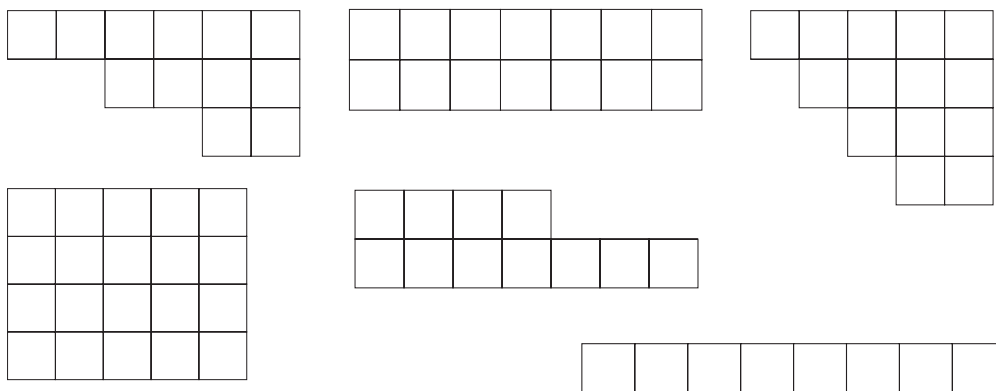
- 7 videos, with £1 not spent
- 4, £200
- 9 lengths
- 4 minibuses
- (a) 2 '50 cm' and 4 '20 cm' (or 9 '20 cm') (b) £11 (or £13.50)
- (a) 3 (b) 7
- 4 times
- 13 (with 2 pupils left over)
- £5000
- 5 coaches, £250; 6 39-seater coaches, costing £210 is cheapest option.

# 17 Perimeters and Areas

## 17.1 Perimeters

- (a) 8 cm (b) 14 cm (c) 16 cm (d) 12 cm  
 (e) 18 cm (f) 16 cm (g) 16 cm (h) 14 cm  
 (i) 14 cm (j) 26 cm (k) 12 cm (l) 24 cm
- (a) 11 cm (b) 15 cm (c) 10 cm (d) 17 cm  
 (e) 20 cm

3. Many possible shapes (using squares with side length 1 cm), e.g.



4. (a) 16 cm, 10 cm, 12 cm, 12 cm      (b) 50 cm

## 17.2 Areas

1. (a)  $8 \text{ cm}^2$       (b)  $6 \text{ cm}^2$       (c)  $6 \text{ cm}^2$       (d)  $9 \text{ cm}^2$   
 (e)  $18 \text{ cm}^2$       (f)  $13 \text{ cm}^2$       (g)  $10 \text{ cm}^2$       (h)  $16 \text{ cm}^2$   
 (i)  $16 \text{ cm}^2$       (j)  $20 \text{ cm}^2$       (k)  $16 \text{ cm}^2$       (l)  $22 \text{ cm}^2$
2. (a)  $14 \text{ cm}^2$       (b)  $15 \text{ cm}^2$       (c)  $17 \text{ cm}^2$       (d)  $13.5 \text{ cm}^2$       (e)  $23 \text{ cm}^2$
3. Many possibilities
4. (a)  $28 \text{ cm}^2$

# 18 Time

## 18.1 12- and 24-hour Clock

1. (a) 30 mins      (b) 50 mins      (c) 1 hr 30 mins      (d) 14 hrs 40 mins  
 (e) 12 hrs 31 mins      (f) 28 mins      (g) 9 hrs 21 mins      (h) 43 mins  
 (i) 1 hr 45 mins      (j) 48 mins
2. (a) 1720      (b) 0830      (c) 1816      (d) 0945      (e) 0715  
 (f) 1915      (g) 0925      (h) 1640
3. (a) 4.40 pm      (b) 7.35 am      (c) 7.55 pm      (d) 5.30 pm  
 (e) 7.15 am      (f) 11.32 am      (g) 2.45 pm      (h) 10.47 am
4. (a) 13.55      (b) 14.10      (c) 14.45      (d) 15.55      (e) 17.15

## 18.2 Times and Timetables

1. 2 hrs 5 mins (or 125 mins)
2. 40 mins
3. 12.45
4. 10.25
6.  $7\frac{1}{4}$  hours
7. 4.07
8. (a) 1 hr 25 mins (b) 1 hr 35 mins (or 95 mins)
9. 1 hr 40 mins (or 100 mins)
10. 11.45 am
11. 10.00 pm – Start of News at Ten  
7.30 pm – Coronation Street  
12.30 pm – Lunch  
3.00 pm – Kick-off time  
9.00 am – Start of school  
11.15 pm – Horror film starts  
5.30 pm – Closing time for shop  
12.00 am – Midnight  
3.30 pm – End of school  
6.00 am – Milk delivered
12. (a) 2 hours 5 mins (or 125 mins) (b) Casualty  
(c) 12.50 (d) 4 hours
13. (a) 1730 (b) 0830 (c) 1025 (d) 2335  
(e) 0410 (f) 2045 (g) 1815 (h) 1330
14. (a) 2 hrs 15 mins (or 135 mins)  
(b) 1930, 2000, 2030, 2100, 2200, 2240, 2355
15. (a) (i) 0955 (ii) 10.39 (b) 0600 (c) 1039

## 19 Number Concepts 5

### 19.1 Money Problems

1. (a) £5.68 (b) £9.41 (c) £6.14 (d) £1.77  
(e) £6.77 (f) 86p
2. £12.47
3. £83.28

4. £6.91
5. £7.12
6. £8.58
7. £40.50
8. £12.60
9. £3.50
10. (a) 23.62 m      (b) Yes (just!)
11. £8.50
12. £12.75
13. £89.00
14. £20.00  
£34.95  
£54.95
15. £6.75  
£3.00  
£1.65  
£1.68  
£13.08

## 19.2 Calculations with Fractions

1. (a)  $\frac{2}{5}$       (b)  $\frac{1}{5}$       (c)  $\frac{1}{2}$  (or  $\frac{3}{6}$ )      (d)  $\frac{3}{8}$
2. (a) 1 square shaded      (b) 1 square shaded      (c) 1 square shaded  
(d) 1 square shaded      (e) 1 square shaded      (f) 1 square shaded  
(g) 3 squares shaded      (h) 5 squares shaded      (i) 7 squares shaded  
(j) 4 squares shaded      (k) 3 squares shaded      (l) 2 squares shaded  
(m) 2 squares shaded      (n) 3 squares shaded      (o) 2 squares shaded  
(p) 4 squares shaded      (q) 6 squares shaded      (r) 3 squares shaded  
(s) 8 squares shaded
3. (a) 9      (b) 5      (c) 9      (d) 7      (e)  $6\frac{1}{2}$   
(f) 27      (g) 20      (h) 30      (i) 24      (j) 180

### 19.3 Percentages

1. (a) (i) 50% (ii) 50% (b) (i) 25% (ii) 75%  
 (c) (i) 75% (ii) 25% (d) (i) 75% (ii) 25%  
 (e) (i) 20% (ii) 80% (f) (i) 20% (ii) 80%  
 (g) (i) 20% (ii) 80% (h) (i) 25% (ii) 75%  
 (i) (i) 80% (ii) 20%
2. (a) 50% (b) 75% (c) 20% (d) 25%  
 (e) 50% (f) 10% (g) 80% (h) 20%  
 (i) 60% (j) 60% (k) 80% (l) 90%
3. (a) 40 m (b) 80 m (c) 100 m (d) 200 m (e) 300 m  
 (f) 320 m (g) 360 m (h) 160 m
4. (a) 10 kg (b) 10 m (c) £5 (d) 20 g (e) £300 (f) 50 m  
 (g) £180 (h) 225 g (i) 40 m (j) 50 kg (k) 60 m (l) 100 g  
 (m) £40 (n) £300 (o) 75 m
5. (a) £3 (b) £33 (c) £7
6. 120 g
7. (a) £12 (b) £36
8. (a) £1200 (b) £2800
9. (a) £30 (b) £150
10. (a) £6 (b) £36
11. (a) 3 kg (b) 8 kg

### 19.4 Quantities as Percentages

1. (a) 42% (b) 16% (c) 12% (d) 80% (e) 70% (f) 94%  
 (g) 15% (h) 90% (i) 64% (j) 25% (k) 75% (l) 20%
2. (a) 40% (b) 60%
3. (a) 64% (b) 36%
4. (a) 20% (b) 80%; 50%
5. (a) 75% (b) 25%
6. 14%
7. (a) 4% (b) 96%
8. 70%
9. (a) 76% (b) 24%
10. (a) 60% (b) 40%

# 20 Data Analysis 3

## 20.1 Sorting and Classifying Data

1.

	<i>More than 20</i>	<i>Less than 20</i>
<i>Odd</i>	25, 21	15, 7
<i>Even</i>	24, 60	12, 4

2.

	<i>Odd</i>	<i>Even</i>
<i>One digit</i>	5, 1	6, 4
<i>Two digits</i>	13, 99	26, 72
<i>Three digits</i>	221	172, 150

3.

	<i>More than 10</i>	<i>Less than 10</i>
<i>One decimal place</i>	12.2	0.2, 6.5
<i>Two decimal places</i>	15.11, 10.75	7.12, 5.76

4.







	<i>Even</i>	<i>Odd</i>
<i>2 is a factor</i>	4, 22, 34	
<i>3 is a factor</i>		9
<i>5 is a factor</i>		45, 25
<i>7 is a factor</i>		49
<i>none of 2, 3, 5 and 7 are factors</i>		19, 1, 13

5.






	<i>Odd</i>	<i>Even</i>
<i>Positive</i>	7, 13, 21	12, 6
<i>Negative</i>	-5, -7, -11	-6, -16, -4

## 20.2 Pictograms






1.

Ben	
Sarah	
Morag	
Peter	
Jay	
Marcus	




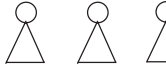


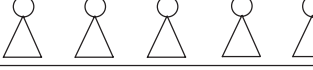
2.

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

3.

Aston Villa	
Everton	
Leeds	
Southampton	
Blackburn	

4.

Sunday	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

## 20.3 Line Diagrams

- (a) Dick, 175 cm      (b) 2nd      (c) John and Simon      (d) 20 cm
- (a) 4      (b) Crystal Palace and Tottenham      (c) Coventry
- (a) (i) Los Angeles      (ii) Moscow      (b) 21°C      (c) New York  
(d) London      (e) 18°C  
(f) (i) 30°C      (ii) 24°C      (iii) 36°C

# 21 Probability

## 21.1 Outcomes

- (a) 1, 2, 3, 4, 5, 6      (b) Yes
- |    |     |
|----|-----|
| 2p | 10p |
| H  | H   |
| H  | T   |
| T  | H   |
| T  | T   |

- H 1, H 2, H 3, H 4, H 5, H 6  
T 1, T 2, T 3, T 4, T 5, T 6
- FT, FR, MT, MR, CT, CR
- AB, AC, AD, BC, BD, CD
- VR, MR, MC, SR, SC
- DNF, DFN, NFD, NDF, FDN, FND

8. (a) 12  
 (b) 2; No, they are not all equally likely to occur
9. (a) 18  
 (b) 3

## 21.2 Estimating the Likelihood of Events

1. (a) U (b) I (c) I (d) L (or U) (e) ?  
 (f) U (g) U (h) L (i) I (j) C
2. (a) EC (b) GC (c) PC (d) GC (e) EC  
 (f) ? (g) PC (h) EC (i) ? (j) ?

## 21.3 Estimating Probabilities

Responses could vary according to the current situation, etc.

# 22 Number Machines 2

## 22.1 Two Function Machines

1. (a)

<i>Number in</i>	<i>Number out</i>
2	11
3	15
4	19
6	27

(b)

<i>Number in</i>	<i>Number out</i>
3	0
5	4
7	8
9	12

(c)

<i>Number in</i>	<i>Number out</i>
3	21
4	24
2	18
6	30

(d)

<i>Number in</i>	<i>Number out</i>
8	1
12	3
10	2
16	5

(e)

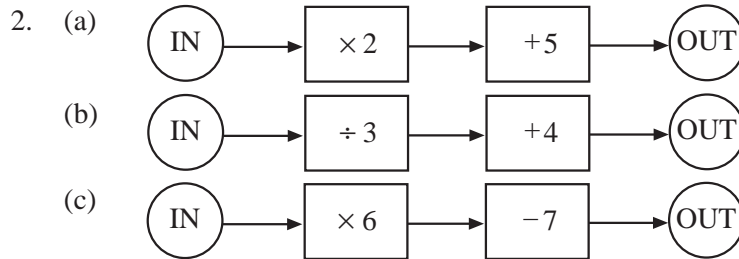
<i>Number in</i>	<i>Number out</i>
4	3
7	4
22	9
40	15

(f)

<i>Number in</i>	<i>Number out</i>
2	8
2.5	11
1.5	5
3	14

(g)

<i>Number in</i>	<i>Number out</i>
4	6
5	7.5
6	9
10	15



## 23 Number Patterns

### 23.1 Finding the Pattern

- (a) 10, 12      (b) 15, 18      (c) 17, 19      (d) 8, 4      (e) 49, 42

(f) 26, 21      (g) 16, 32      (h) 48, 96      (i) 81, 243      (j) 115, 116

(k) 50, 25      (l) 20, 10      (m) 30, 10
- (a) 15, 21 – differences increasing by 1 each time

(b) 25, 36 – square numbers

(c) 31, 43 – differences increasing by 2 each time

(d) 60, 55 – differences decreasing by 1 each time

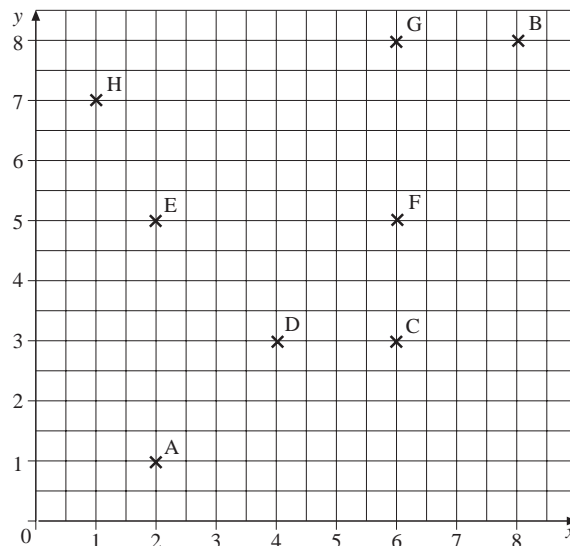
(e) 42, 50 – difference of 8 each time

(f) 25, 32 – difference increasing by 1 each time

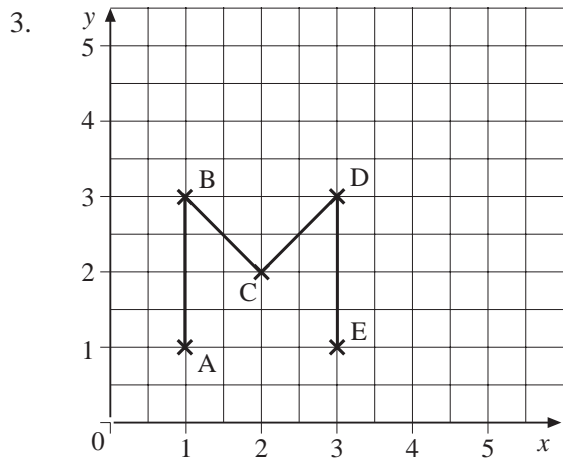
## 24 Coordinates

### 24.1 Plotting Points

1.



2. (a) C, F, G      (b) Yes – A, D, F (but not on a grid line)



## 24.2 Finding Coordinates

1. (a) (1, 2)      (b) (2, 5)      (c) (6, 2)      (d) (4, 0)  
 (e) (3, 2)      (f) (6, 7)      (g) (0, 6)      (h) (4, 6)
2. Join (1, 1) to (1, 3); (1, 2) to (2, 2); (2, 1) to (2, 3)


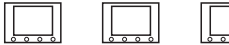


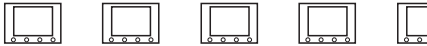

## Miscellaneous Exercises

1. (a) 470      (b) 5300      (c) 26      (d) 40
2. 8
3. 5; £5.05
4. A : perimeter = 16 cm, area = 10 cm<sup>2</sup>  
 B : perimeter = 22 cm, area = 10 cm<sup>2</sup>  
 C : perimeter = 16 cm, area = 10 cm<sup>2</sup>
5. 1223
6. 9.06 am
7. (a) 55 mins      (b) 1 hr 50 mins (or 110 mins)      (c) 1.05 am
8. £11.20
9. 4 squares shaded
10. (a) 2 m      (b) 6 kg
11. 2 squares shaded
12. (a) £15      (b) 5 m

13.

	<i>Odd</i>	<i>Even</i>
<i>One digit</i>	7, 9, 1	4
<i>Two digits</i>	39, 17	12, 76, 20, 10

14.

Lucy	
Tom	
Jay	
Peter	
Sarah	
John	

15. (a) E      (b) A      (c) 5 cm      (d) C and F

16. 0, 1, 2, 3, 4, 5

17.

<i>Number in</i>	<i>Number out</i>
2	8
40	236
4	20
9	50

18. (a) 17, 21; add 4 each time  
 (b) 18, 15: take away 3 each time  
 (c) 17, 23: difference increasing by 1 each time

19. (a) A (2, 1)      (b) B (1, 4)

