Number

Page 2 Whole numbers

1. 670
2. 362
3. 82 485
4. 384
5. 6540
6. 32
7. 1 982 064
8. 119
9. 97
10. 4 224 990
11. 1328
12. $6879, $872
13. 3 778 560 apples, 78 720 rotten
14. 155

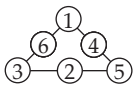
Fun Spot

Bill found a nest of bees in a hole by the shell oil tank. Bill never tells lies.

Page 3 Decimals

1. 6.42
2. 29.54
3. 525.93
4. $1164.71
5. $18.98
6. 52.1
7. 84.8625
8. 230
9. $9.01
10. $7134.50
11. 6.33
12. Cost = $75.20
Change = $24.80
13. $9.55 p/h and 67 c more
14. Total cost = $942.25
$37.69 per metre

Problem Solving



Page 4 Applications

1. $698.50
2. $17.85
3. $304
4. $3000
5. $59
6. $336.50
7. $746
8. 240.8 metres
9. $993.24
10. $24.70
Problem Solving 1 5 10 10 5 1

Page 5 Prime Numbers

6. 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97

7. Anything divisible by 4 is also divisible by 2. Anything divisible by 6 is also divisible by 2. Anything divisible by 8 is also divisible by 2. Anything divisible by 9 is also divisible by 3.

Page 6 Order of Operations (Brackets)

1. 55
2. 84
3. 5
4. 45
5. 70
6. 24
7. 180
8. 21
9. 36
10. 56
11. 9(7 + 5) = 108
12. 11 x (27 + 4) = 341
13. 8 x (75 – 3) ÷ 2 = 288
14. 12 x (120 + 2 + 4) = 1512
15. 20 x 16 x (15 – 3) = 3840

Problem Solving

$4.00

Page 7 Order of Operations (BEDMAS)

1. 30
2. 33
3. 18
4. 7
5. 17
6. 17
7. 32
8. 4
9. 25
10. 468
11. 6 x 15 x (5 + 3 + 1) = 810
12. 810 000 ÷ 45 ÷ 40 = 450
13. 12 x (45 – 2 – 1) = 504
14. 700 – 13 x (2 x 15 + 3) = 271
15. 48 x (5 x 7 + 2 x 3) = 1968

Problem Solving

Page 8 Squares, Squares Roots and Powers

Across

1. 16
3. 144
4. 24
5. 45
6. 500
8. 35
10. 17
11. 36

Down

1. 125
2. 64
3. 100
5. 40
7. 679
8. 33
9. 37
10. 13

Problem Solving

3	4	2
2	3	4
4	2	3

Page 9 Addition and Subtraction of Integers 1

1. $^{-}8$
2. $^{-}23$
3. 14
4. $^{-}16$
5. $^{-}24$
6. $^{-}19$
7. $^{-}34$
8. 25
9. 36
10. 42
11. $37
12. $^{-}25^{\circ}$ C
13. $^{-}18$ m
14. No short by $15
15. $^{-}28^{\circ}$ C

Problem Solving
2 Wimbles and 3 Widges

Page 10 Addition and Subtraction of Integers 2

1. 12
2. $^{-}5$
3. 16
4. 25
5. $^{-}15$
6. $^{-}43$
7. 13
8. $^{-}75$
9. $^{-}10$
10. 90
11. $^{-}34$ m
12. $^{-}420$ (420 BC)
13. $^{-}151$ metres

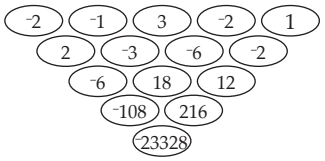
Fun Spot

$^{-}1$	$^{-}2$	3
4	0	$^{-}4$
$^{-}3$	2	1

Problem Solving
20c, 20c, 20c, 10c, 10c, 10c, 10c

Page 11 Multiplication of Integers

1. $^{-}12$
2. $^{-}40$
3. 24
4. $^{-}72$
5. 80
6. 84
7. 180
8. $^{-}1568$
9. $^{-}468$
10. 192
11. $^{-}102$ m
12. $^{-}\$1380$
13.

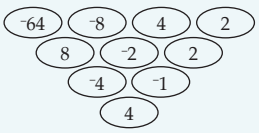


14. $^{-}8$, 24, $^{-}10$, $^{-}30$

Problem Solving
20 squares

Page 12 Division of Integers

1. $^{-}9$
2. 53
3. $^{-}139$
4. 91
5. 11
6. $^{-}8$
7. $^{-}5$
8. 5
9. $^{-}16$
10. $^{-}28$
11. $31 068
12. $42 000
13.



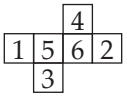
14. $^{-}16$, $^{-}20$, $^{-}10$, 25

Problem Solving
Peter

Page 13 Integer Applications

1. $^{-}\$2380$
2. \$804 in debt $^{-}\$804$
3. $^{-}216$
4. $^{-}451$ metres
5. Yes by $18
6. Owes the bank $14

Problem Solving



Page 14 Number Review 1

1. 12 253
2. 28
3. 4216
4. 285
5. 44 950 m
6. 31 536 000 secs
7. 90.75
8. $24.44
9. 78
10. 9.0636
11. $280
12. $435.20
13. 37
14. 63
15. 36
16. 72
17. $519
18. 1920 km
19. 125
20. 81
21. 16
22. 13
23. 7
24. 55
25. $^{-}8$
26. $^{-}54$
27. 16
28. a) $21.55 b) $120.05

Page 15 Rounding

1. 4.28
2. 3.143
3. 132.1
4. 14.20
5. 10.8
6. 2.00
7. 0.004
8. 9.6
9. 0.63
10. 892.3
11. $28.57
12. 22.8
13. 6.8

Problem Solving

17, 19 and 21

Page 16 Equivalent Fractions

1. 2
2. 9
3. 21
4. 54
5. 21
6. 48
7. 3
8. 5
9. 5
10. 5
11. a) $\frac{3}{12}$ b) $\frac{1}{4}$ (other ans. pos.)
12. a) $\frac{15}{105}$ b) $\frac{1}{7}$ (other ans. pos.)
13. a) $\frac{20}{28}$ b) $\frac{5}{7}$ (other ans. pos.)

Problem Solving

16 different signals

Page 17 Fraction of a Quantity

1. 7 apples
2. 15 matches
3. 8 worms
4. 96 raisins
5. 15 chips
6. $32
7. $16
8. $24
9. 81 blocks
10. 28
11. a) $28 b) $\frac{1}{5}$
12. a) $\frac{7}{10}$ b) 96
13. a) $\frac{7}{9}$ b) 56 boxes

Problem Solving

Jane $150, Peter $130, Simon $115

Page 18 Fractions to Decimals

1. 0.2
2. 0.4
3. 0.075
4. 0.35
5. 0.75
6. 0.625
7. $\frac{7}{10}$
8. $\frac{13}{20}$
9. $\frac{1}{25}$
10. $\frac{3}{5}$
11. $\frac{3}{2}$
12. $\frac{1}{8}$
13. 0.6
14. Edward 0.375 friend 0.36 so Edward
15. No $\frac{2}{7} = 0.2857...$ which is not the same as 0.29
16. $\frac{9}{20}$

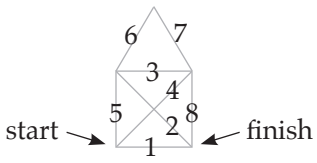
Problem Solving

52.8 m

Page 19 Fractions and Decimals to Percentages

1. 36%
2. 20%
3. 7%
4. 35.8%
5. 170%
6. 40%
7. 16%
8. 20%
9. 57.1% (1 dp)
10. 140%
11. $\frac{19}{20}(95\%)$
12. 45% and 55%
13. 12%
14. 62.5%
15. $\frac{7}{50}$ = 14% and 0.15 = 15%. Marty's school

Problem Solving



Page 20 Fractions (+, –)

1. $\frac{6}{7}$
2. $\frac{31}{40}$
3. $2\frac{39}{40}$
4. $4\frac{11}{14}$
5. $4\frac{13}{20}$
6. $\frac{1}{3}$
7. $\frac{2}{21}$
8. $3\frac{17}{35}$
9. $1\frac{5}{8}$
10. $\frac{17}{24}$
11. $\frac{11}{20}$
12. 4
13. $\frac{17}{40}$
14. 120 km

Fun Spot

N I N E

Page 21 Fractions (x, ÷)

1. $\frac{6}{25}$
2. $\frac{3}{10}$
3. $7\frac{1}{3}$
4. $\frac{36}{77}$
5. $\frac{1}{8}$
6. $\frac{20}{27}$
7. $1\frac{1}{2}$
8. $5\frac{1}{4}$
9. $\frac{16}{21}$
10. $10\frac{5}{6}$
11. $115
12. $\frac{1}{6}$
13. $\frac{8}{15}$
14. David $\frac{1}{3}$, John $\frac{1}{2}$ and Anne $\frac{1}{6}$

Fun Spot

Page 22 Fractions

1. $\frac{3}{20}$
2. $\frac{5}{6}$ cup
3. 12
4. 135
5. 15
6. 340
7. $\frac{3}{20}$
8. 18
9. $50 000, $37 500, $62 500
10. $\frac{1}{8}$m

Problem Solving 150 pages

Page 23 Converting Percentages

1. $\frac{3}{10}$
2. $\frac{13}{20}$
3. $\frac{14}{25}$
4. $\frac{6}{5}\left(1\frac{1}{5}\right)$
5. $\frac{1}{8}$
6. 0.19
7. 0.06
8. 1.5
9. 0.005
10. 0.0003
11. $\frac{9}{20}$
12. 0.35
13. $\frac{11}{20}$
14. 0.015
15. $\frac{16}{25}$

Problem Solving 5 0's, 15 1's, 15 2's, 15 3's, 15 4's, 6 5's, 5 6's, 5 7's, 5 8's, 5 9's

Page 24 Quantity as a Percentage

1. 25%
2. 45%
3. 30%
4. 55%
5. 90%
6. 32%
7. 80%
8. 32.5%
9. 20%
10. 75%
11. 37.5%
12. 60%
13. 30%

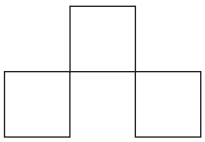
Fun Spot

Three blind mice

Page 25 Percentages of Amounts

1. $3
2. 15
3. $66.50
4. $26.25
5. 54
6. 100
7. 825
8. $91
9. $52.50
10. $19.50
11. 11 hours 15 mins
12. $1325
13. 744

Problem Solving



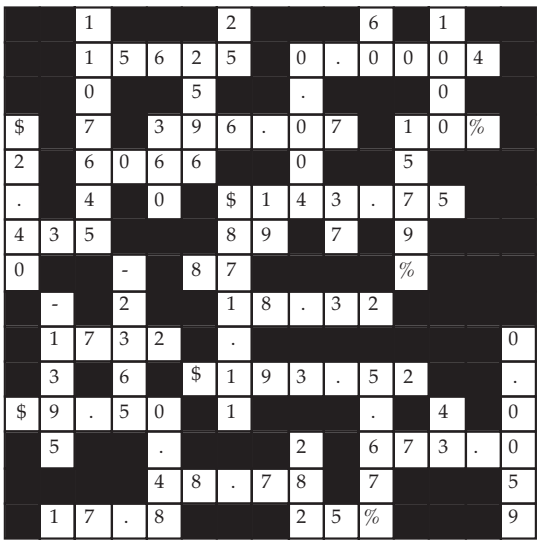
Page 26 Standard Form

1. 1.4×10^6
2. 3.85×10^{11}
3. 4.085×10^5
4. 1.0×10^7
5. 2.5×10^9
6. 7.08×10^{12}
7. 5.28×10^0
8. 1.4975×10^2
9. 1.487×10^{11}
10. 1.65×10^8
11. 3.75×10^6
12. 1.575×10^6
13. 5.525×10^6
14. 2.65512×10^8

Problem Solving

7

Page 27 Number Crossnumber



Page 28 Number Review 2

1. 36.4
2. 27.39
3. 0.005
4. 2.00
5. 179.7 cm^3
6. 3.78×10^8
7. 0.625
8. 1.24
9. 0.175
10. $1\frac{2}{21}$
11. $1\frac{10}{11}$
12. $3\frac{2}{3}$
13. $2\frac{41}{60}$
14. $2\frac{31}{35}$
15. $160
16. 112 cars
17. 220 c, 40 s, 15 chick
18. 75%
19. 3%
20. 125%
21. 15%
22. 87.5%
23. $4.50
24. $5.63 or $5.62
25. $78.40
26. a) $1450
b) $5499
c) $1149

Measurement

Page 30 Metric Units (Length and Area)

1. 12.4 cm
2. 569 mm
3. 4.56 m
4. 3240 mm
5. 109.2 cm
6. 12.397 km
7. 4230 m
8. 45 cm^2
9. 1.6456 ha
10. 56 000 m^2
11. 1.56 m
12. 7.3 km
13. 6.28 m
14. The 2nd Tower is 10 cm (0.1 m) taller
15. 1.8 ha
16. 4 ha

Problem Solving
12 litres of petrol.

Page 31 Metric Units (Volume, Capacity and Mass)

1. 3 200 000 cm^3
2. 1.250 L
3. 1.2 g
4. 2.4 kg
5. 1500 g
6. 1750 mL
7. 1.2 m^3
8. 234 500 mg
9. 16.5 Tonnes
10. 450 g
11. 1000 cm^3
12. 1.426 Tonne
13. 40 g
14. 1.26 kg
15. 6 L
16. 48 kg
17. 208 mL

Problem Solving
Box weighs 75 g

Page 32 Perimeter

1. 128 cm
2. 13 m
3. 87 cm
4. 54.4 cm
5. 164.8 cm
6. 46.3 cm
7. 5.4 cm

Problem Solving
7 cm, 7 cm and 7 cm
6 cm, 7 cm and 8 cm
5 cm, 8 cm and 8 cm
6 cm, 6 cm and 9 cm
5 cm, 6 cm and 10 cm
5 cm, 7 cm and 9 cm
4 cm, 7 cm and 10 cm
4 cm, 8 cm and 9 cm
3 cm, 8 cm and 10 cm
3 cm, 9 cm and 9 cm
2 cm, 9 cm and 10 cm
1 cm, 10 cm and 10 cm

Page 33 Area

1. 943 cm^2
2. 294.5 cm^2
3. 1.5 m^2
4. 23.36 m^2
5. 3.375 m^2
6. 8.41 m^2

Problem Solving
56 tiles.

Page 34 Circles

1. C = 39.6 cm (1 dp)
2. C = 260.8 mm (1 dp)
3. C = 7.8 m (1 dp)
4. P = 308.5 cm (1 dp)
5. A = 2551.8 mm^2 (1 dp)
6. A = 265.9 cm^2 (1 dp)
7. A = 1.9 m^2 (1 dp)
8. A = 7.1 m^2 (1 dp)

Application Problem
Distance = 407.3 m

Page 35 Compound Figures

1. 679 cm^2
2. 39 200 cm^2 (or 3.92 m^2)
3. 13.8 m^2
4. 3082.7 mm^2
5. Triangle = 10.8 cm^2
Rectangle = 23.4 cm^2
Total = 34.2 cm^2
6. Large semi-circle = 25.1 cm^2
Small semi-circles = 12.6 cm^2
Total = 37.7 cm^2

Problem Solving
Area = 42 m^2

Page 36 Speed

1. a) Car = 70.5 km/h
b) Bus = 51.3 km/h
2. a) Walk = 0.2 km/min
or = 12 km/h
b) Time = 0.6 hours
or = 36 minutes
3. a) Speed = 92.0 km/h
b) Speed = 170.3 km/h
c) Dist. = 5332.8 km

Problem Solving
Fill the milk carton and pour it in the litre container. Fill it again but now you can only pour 400 mL in the litre container leaving 200 mL in the milk carton.

Page 37 Pythagoras

1. $x^2 = 5^2 + 12^2$
$= 169$
$x = 13$ cm

2. $y^2 = 3.5^2 + 8.4^2$
$y = 9.1$ m

3. $z^2 = 2.42^2 + 2.42^2$
$z = 3.42$ cm

4. $D^2 = 14.5^2 + 6.5^2$
$D = 15.9$ km

5. $v^2 = 4.62^2 + 5.45^2$
$v = 7.14$ m

6. $w^2 = 50^2 + 37.5^2$
$w = 62.5$ mm

Problem Solving

Treat the sides as a flat surface 2100 by 2800.

$h^2 = 2100^2 + 2800^2$
$h = 3500$ mm

Page 38 Time Including Twenty-Four Hour Time

1. 0734 (ignore (07:34)
2. 2015
3. 2400 (accept 0000)
4. 1530
5. 1200
6. 0205
7. 1752
8. 10:30 am
9. 7:30 pm
10. 9 am
11. 12:15 am (15 minutes past midnight)
12. 11:56 pm
13. 12 pm or midday
14. 2 hours 5 minutes
15. 1 hour 55 minutes
16. 2205 (10:05 pm)
17. 1810 (6:10 pm)
18. 2240 to 0100
19. 0230 to 0430

Application Problem

1356 hours (1:56 pm)

Page 39 Volume of Cuboids

1. 22.8 cm^3
2. 91 125 mm^3
3. 83.8 m^3 (1 dp)
4. 105 840 mm^3
5. 1 000 000 cm^3
6. 444.3 m^3 (1 dp)
7. 8.6 m^3
Must use only metre so 125 cm = 1.25 m.

Application Problem

Volume = 79.3 m^3

Students = 19
Rounding down from 19.8

Page 40 Capacity

1. 2.5 L
2. 3250 mL
3. 14.567 L
4. 1.850 L
5. 1875 mL
6. 550 mL
7. 300 mL
8. 1.5 L
9. 2.175 L
10. 1.5 L
11. 5.6 L
12. 10
13. 66
14. 1002 mL
15. 1920 L

Application Problem

77 whole drinks.

Page 41 Tables

1. $2.95
2. $9.00
3. $6.50
4. Two of 20 = $8.00
5. Two of 6 = $5.90
6. Four of 20 = $16.00
7. 60 books
(Three of 20 with a $1 in change)
8. Napier
9. Wellington
10. $83 000
11. 3:42 am and 4:21 pm (am and pm are needed)
12. 12 hours 40 minutes
13. 2.1 m

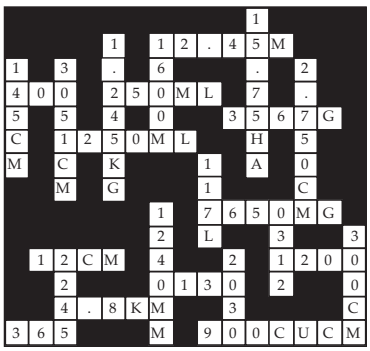
Communication Problem

Start: Noon

Length: about 6 hours
Finish: 6:15 pm

Times during the night were ignored.

Page 42 Measurement Crossnumber



Page 43 Measurement Review

1. 3450 mm
2. 2500 m
3. 7.5 kg
4. 0.6 L
5. Perim. = 49 cm
Area = 87.96 cm^2
6. Area = 1.215 m^2
7. 5.75 L
8. 32 (32.9)
9. 2143
10. 11:50 pm
11. 2 hours 5 minutes
12. C = 103 m (103.04)
A = 845 m^2 (844.96)
13. 90 km/h
14. Vol. = 1008 cm^3
15. Palmerston North (Palm. Nth.)
16. 39.9 mm
17. 3.9 mm
18. 10.4 m

Algebra

Page 45 Introduction to Algebra

1. b + 6
2. 5b or 5 x b
3. 2b + 4 or 2 x b + 4
4. 12K or 12 x K
5. 10B + 6 or 10 x B + 6
6. 5d or 5 x d
7. 5d + 2 or 5 x d + 2
8. T = 5S or T = 5 x S
9. T = 5S – 12 or T = 5 x S – 12
10. SP = 440 or $P = \frac{440}{S}$ or $S = \frac{440}{P}$
11. P = 675 ÷ 25
12. P + 3 x P = 24 or P + 3P = 24 or 4P = 24
13. D = 11 – 6
14. x + x + 4 = 16

Problem Solving
$16.67 per hour

Page 46 Algebraic Substitution

1. 4A = 36
2. A + 7 = 16
3. B – 3 = 1
4. 5C = 0
5. 2B + 1 = 9
6. 4 – B = 0
7. 3A + 2 = 29
8. 2B – 8 = 0
9. A + B + C = 13
10. A – 5C = 9
11. AB = 36
12. B ÷ 2 = 2
13. $\frac{A}{3} = 3$
14. 5L = 4250 m
15. 11C + 13 = 288 pkt
16. 13B + 31 = 551 kg
17. 15B + 14 = 314 pens

Problem Solving
9 boys

Page 47 Using Simple Formulae

1. Wght.= 4.5 kg
2. Wght.= 1.35 kg
3. Tax = $50
4. Tax = $3.50
5. Cost = $275
6. Cost = $55
7. Rental = $225
8. R = 50D + 25

Problem Solving
5 ordered two fish.

Page 48 Solve Linear Equations (single step)

1. x = 15
2. x = 19
3. x = 17
4. x = 15
5. x = 8
6. x = 16
7. x = 2
8. x = 8
9. y = 9
10. z = 8

Application Problem
12A = 84
A = 7 years

Page 49 Solve Linear Equations (two steps)

1. x = 6
2. x = 3
3. x = 3
4. x = 11
5. x = 8
6. x = 4
7. x = 12
8. x = 20
9. x = 30
10. z = 64

Application Problem
12A + 6 = 30
A = $2 / kg

Page 50 Solve Linear Equations (unknown is an integer)

1. x = ⁻3
2. x = ⁻9
3. x = ⁻3
4. x = 4
5. x = 5
6. x = 11
7. x = ⁻4
8. y = ⁻6
9. x = 2
10. x = ⁻2
11 y = 9

Application Problem
12N + 8 = 92

Page 51 Word Problems

1. Cost = $37.50
2. Cost = $563
3. Cost = $25 750
4. 10 CD = $285
5. Each CD = $28.50
6. 1 tyre cost = $95
7. 1 ticket = $13

Problem Solving
Son = $24
Father = $48

Page 52 Algebra Review 1

1. 7S
2. 4x
3. 4y + 4
4. 25
5. 8
6. 15
7. 11
8. $225
9. $1125
10. 11
11. y = 12
12. y = 5
13. x = ⁻8
14. z = 3
15. z = 13
16. z = 7
17. x = 54
18. Bikes cost $420 each

Page 53 Combining Like Terms

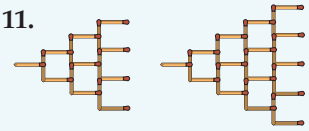
1. 7A + 11
2. 7B + 5
3. 3C + 11
4. 7D – 9
5. 4E + 13
6. ⁻F
7. 4G + 4H
8. 6J + 3K + 2
9. 3M
10. 3x + 11
11. x – 12
12. $x^2 + 4x + 4$
13. $2x^2 + 6x + 2$
14. $5x^2 + x$
15. 6 drinks + 9 chippies + 13 chocolates

Problem Solving

3 answers
13 gum and 2 lollipops
8 gum and 4 lollipops
3 gum and 6 lollipops

Page 54 Patterns and Sequences

1. 20, 23
2. 46, 53
3. 23, 19
4. 486, 1458
5. 32, 16
6. ⁻96, 192
7. 32, 44
8. 36, 49
9. 2, ⁻1
10. 8, 13 (sum of previous two)
11.



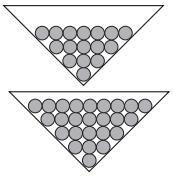
Number 16, 25
12. 25 (16+9), 41 (25+16)

Problem Solving

18 days, as after 17 days the frog is 30 cm from the top.

Page 55 Sequences in Practical Situations

1. a)



1. b) 7, 9 (odd numbers)
1. c) Two x row – 1
OR
Pills = 2R – 1
or equivalent
1. d) 16, 25 (square numbers)
2. a) $103, $120 (difference of 17)
2. b) T = 17 x month + 1
T = 17 x m + 1
or equivalent
3. $23, $37 (previous 2 give next)
4. $50, $62 (differences increase by 2)

Application Problem

2 trips of (18+14+10+6+2) = 100 metres.

Page 56 Sequence Formulae

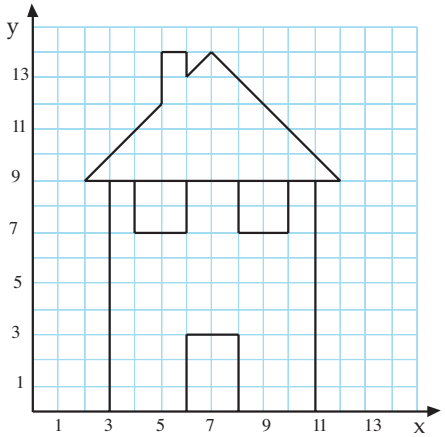
1. 2T + 1, 20th = 41
2. T + 1, 20th = 21
3. P = 2R – 1, 20th = 39
4. $T = R^2$, 20th = 400
5. $\frac{S(S-3)}{2}$, 170 diags.

Problem Solving

They have completed 65%.

Page 57 Graphing Points

1.



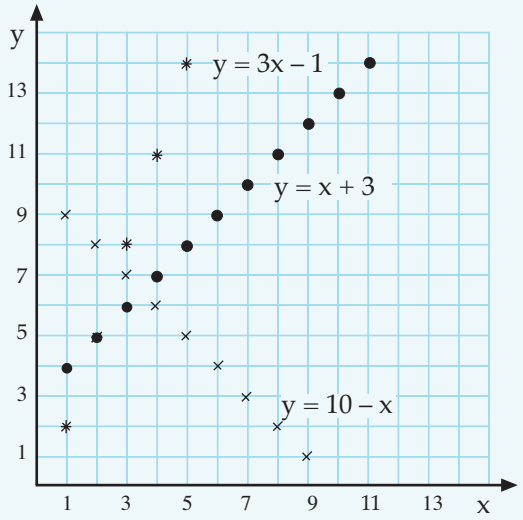
2. YOU ARE GOOD AT GRAPHS

Fun Spot

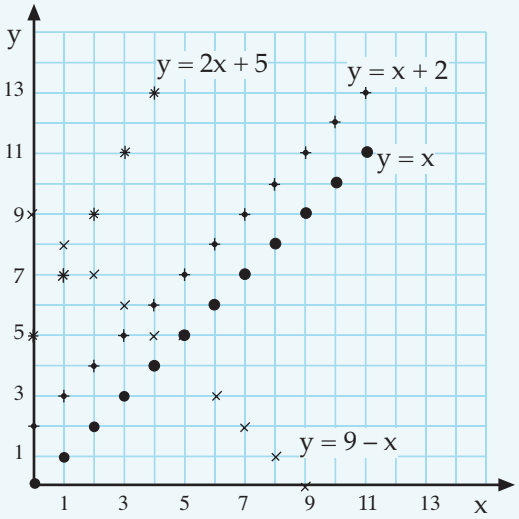
I understand.

Page 58 Graphing Patterns

1. 2. and 3.



4. 5. 6. and 7.



Problem Solving

10 cats (and 2 people).

Page 59 Graphing in Practical Situations

1. 2 minutes 30 s

2. E, lowest speed (gradient) yet still positive.

3. $\text{Speed} = \frac{150}{20}$
$= 7.5 \text{ m/s}$

4. Speed = 10 m/s
Section F

5. 10 seconds

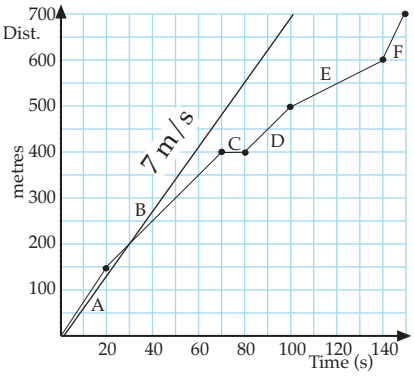
6. See graph

7. A and F as gradient steeper than 7 m/s.

Problem Solving

Tara has $18 and Shona $6.

6.



Page 60 Expanding Algebraic Expressions

1. $2x + 6$
2. $3x + 15$
3. $2y - 4$
4. $5k - 5$
5. $7x + 21$
6. $3u + 6$
7. $15x - 20$
8. $4x + 18$
9. $42y - 48$
10. $6x + 2$
11. $3x + 15$
12. $2t - 8$
13. $3x + 27$
14. $4y - 16$
15. $6x + 10$
16. $x^2 + 2x$
17. $x^2 - 4x$
18. $x^2 + 9x$
19. $3x^2 - 24x$
20. $6x^2 + 2x$

Page 61 Exponents and Algebraic Fractions

1. x^3
2. y^5
3. $2x^4$
4. $x^2 y^4$
5. $e^3 f^2 g$
6. x^5
7. y^3
8. x^3
9. $15x^3$
10. $40y^6$
11. 21
12. 12x
13. $4g^3$

Problem Solving

18 400 000 000 000 000 000 grains.

A calculator gives this answer as 1.84×10^{19}

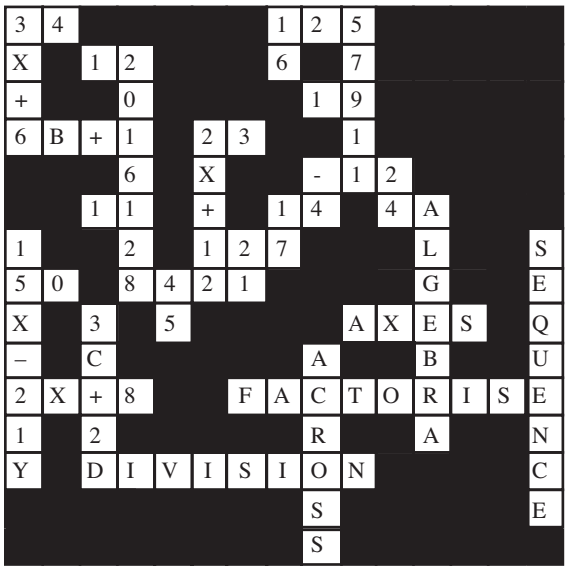
Page 62 Factorising Linear Expressions

1. 2(x + 3)
2. 3(x + 5)
3. 2(y – 2)
4. 5(k – 1)
5. 7(x + 3)
6. 3(u + 2)
7. 5(3x – 4)
8. 2(x + 9)
9. 6(y – 8)
10. 2(x + 1)
11. 5(x – 4)
12. 2(z + 1)
13. 6(y + 6)
14. 2(x + y)
15. 5(3x – 4)
16. 2(2x + 9)
17. 6(7y – 8)
18. 2(3x + 1)
19. 2(4x + 3)
20. 15(x – 2)

Problem Solving

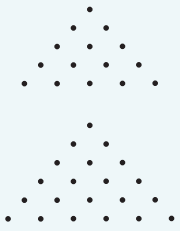
At 20 cheques you would have originally paid $4.40 per month and now will pay $4.40. More than 20 cheques it is true and less than 20 it is more expensive.

Page 63 Algebra Crossmaths

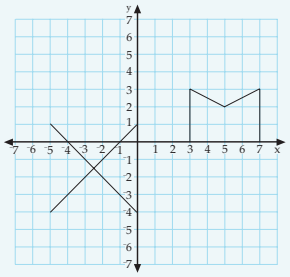


Page 64 Algebra Review 2

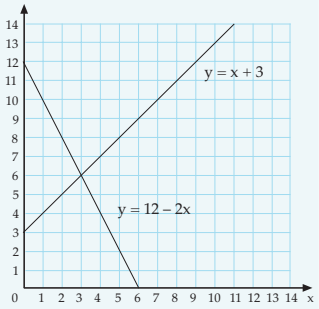
1. 7x + 15
2. 7x + 5
3. 12A + 11
4. 4x – 9
5. x^5
6. y^5
7. x (or x^1)
8. 125
9. 243
10. 3x + 15
11. 4y – 8
12. 6z + 15
13. 4(x + 5)
14. 3(4z – 1)
15. 3(5y + 2)
16. 32, 38
17. 96, 192
18.



19. 9, 11, 13
20. 5, 2, -1
21. 3, 6, 10
22.



23. and 24.



Geometry

Page 66 Angles

1. a) Obtuse b) Reflex
2. c) Right d) Acute
3. e) Straight f) Obtuse g) Acute
4. h) Acute i) Reflex j) Acute
5. k) 60° l) 25° m) 275°
6. n) 108° o) 120° p) 132°

Problem Solving
Wife $120 000, Daughters $60 000, Son $30 000

Page 67 Angles on a Straight Line

1. x = 115°
2. x = 68°
3. x = 63°
4. x = 70°
5. x = 15°
6. x = 20°
7. a = 18° b = 14°
8. c = 132° d = 47°

Page 68 Angles at a Point

1. x = 169°
2. x = 38°
3. x = 213°
4. x = 60°
5. x = 20°
6. x = 20°
7. x = 50°
8. a = 120°
9. b = 60°

Page 69 Vertically Opposite Angles

1. a = 145°
2. b = 33°
3. c = 87° d = 93° e = 93°
4. f = 39° g = 102° h = 102°
5. i = 103° j = 57° k = 57°
6. p = 52° m = 45° n = 45°
7. a = 149° b = 31° c = 31°
8. d = 37° e = 143° f = 143°

Problem Solving
One has 36 spots the other 51 spots.

Page 70 Angle Properties of Parallel Lines

1. a = 152° b = 28° c = 28°
2. d = 49° e = 49° f = 131°
3. g = 143° h = 143° i = 143°
4. j = 96° k = 84° l = 133°
5. m = 126° n = 126° o = 126°
6. p = 64° Coint. angles // lines.
6. q = 64°. Int angles of a tri. sum to 180°. r = 62°. Adj angles on a str. line sum to 180°.

Application Problem
a = 143°, b = 143°, c = 37°

Problem Solving
211

Page 71 Angle Properties of a Triangle

1. a = 46° b = 134°
2. c = 62° d = 79°°
3. e = 63° f = 54°
4. g = 47° h = 133°
5. 6i = 120° i = 20
6. j = 76°
7. 44°
8. 128°

Problem Solving 3 years

Page 72 Angle Properties of a Quadrilateral

1. a = 115° b = 55°
2. c = 117° d = 63°
3. e = 102° f = 78°
4. g = 104° h = 75°
5. i = 52°
6. j = 71°
7. k = 105°
8. L = 109°

Problem Solving 4, 9, 25 and 49

Page 73 Angle Properties Mixed

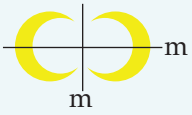
1. a = 102° (E), b = 78° (G), c = 65° (E), d = 115° (F), e = 65° (G)
2. f = 94° (G), g = 16° (E), h = 86° (C), i = 106° (B), j = 74° (G)
3. k = 94° (F), l = 86° (G), m = 47° (A), n = 86° (F)

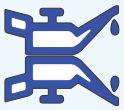
Problem Solving 7 people

Page 74 Reflection

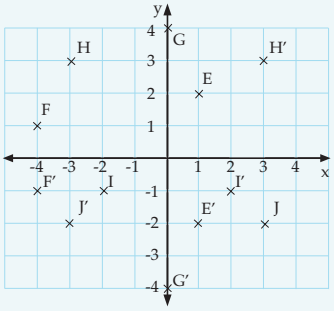
1. 

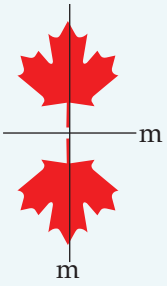
4. 

11. 

2. 

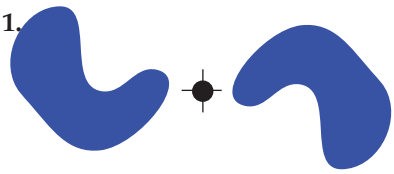
5. 6. 7. 8. 9. 10.

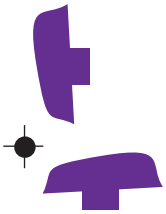


12. 

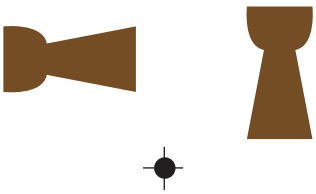
3. 

Page 75 Rotation

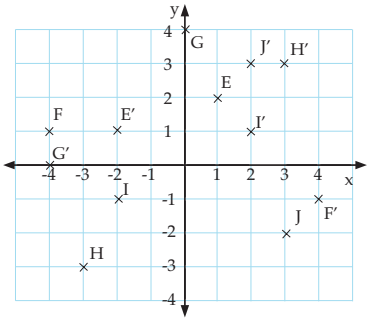
1. 

3. 

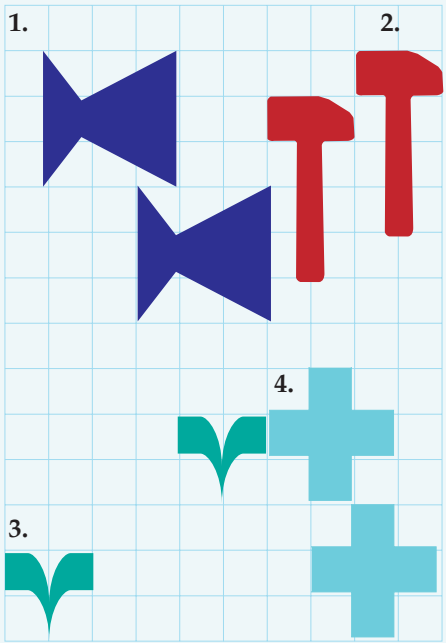
10. Rotation of 90° about (2, -2)

2. 

4. 5. 6. 7. 8. 9.



Page 76 Translation



5. 4 right, 1 down
6. 2 right, 4 up
7. 4 down
8. 2 left
9. 1 left, 7 down
10. 9 right, 5 up

Problem Solving

64

Page 77 Tessellations

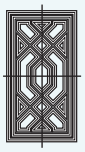
Teacher marked

Page 78 Symmetry

1. 
Axis of symmetry = 1

2. 
Axis of symmetry = 4

3. 
Axis of symmetry = 3

4. 
Axis of symmetry = 2

5. 
Axis of symmetry = 2

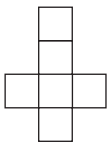
6. 4

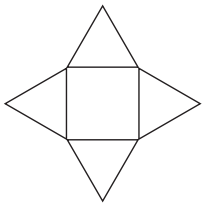
7. 2

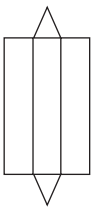
8. 6

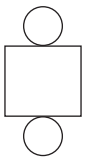
9. 1

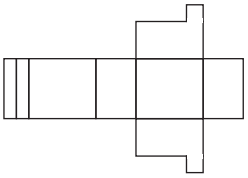
Page 79 Nets

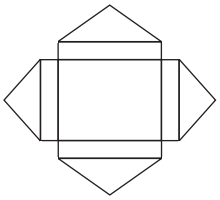
1. 

2. 

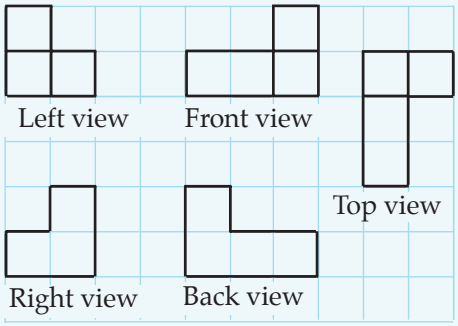
3. 

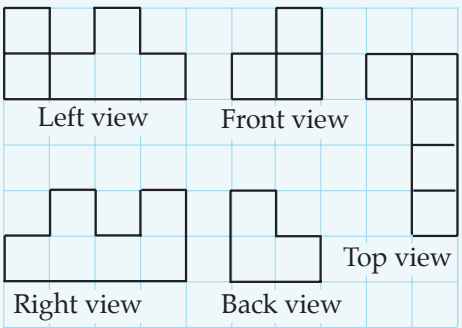
4. 

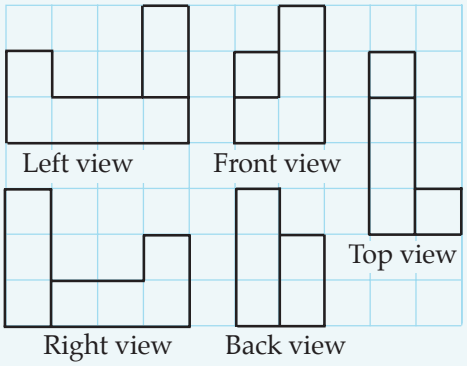
5. 

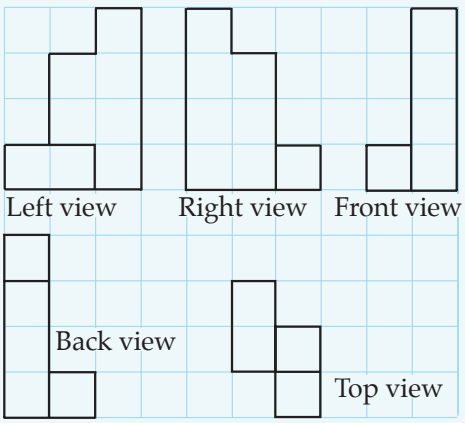
6. 

Page 80 Isometric Drawings

1. 

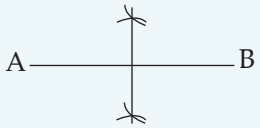
2. 

3. 

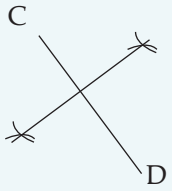
4. 

Page 81 Constructions

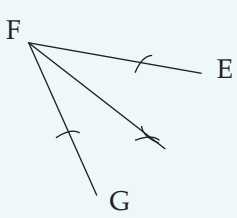
1.



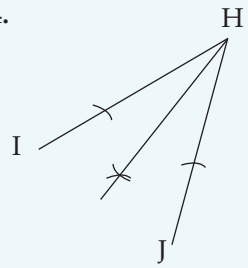
2.



3.

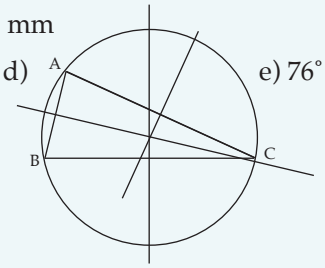


4.



5. a) 23 mm

b) c) d)



e) 76°

Problem Solving

Each daughter has 4 children and each son 2 children

Page 82 Geometry Terms

A. 5	**B.** 3	**C.** 24	**D.** 25
E. 1	**F.** 10	**G.** 14	**H.** 16
I. 2	**J.** 4	**K.** 9	**L.** 12
M. 6	**N.** 21	**O.** 22	**P.** 20
Q. 30	**R.** 18	**S.** 13	**T.** 15
U. 19	**V.** 7	**W.** 8	**X.** 23

Communication Problem

b + c + d = 180° Int. angles of a triangle

a + d = 180° Angles on a straight line

a = b + c

Problem Solving

Pete, Barry, Dave, Ann, Jane

Page 83 Grid References

1. 370630	**4.** 5 or 5.1 km	**7.** Hotel	**10.** $82.50
2. 415610	**5.** Bet. 10 and 11 km	**8.** 035°	
3. 4 km	**6.** 405595	**9.** Church	

Page 84 Bearings and Compass Directions

1. 000°	**6.** 315°	**11.** 315°	**16.** 1800 metres approximately
2. 270°	**7.** 065°	**12.** 090°	
3. 315°	**8.** 128°	**13.** 135°	
4. 135°	**9.** 230°	**14.** 045°	
5. 045°	**10.** 000°	**15.** 240°	

Page 85 Geometry Crossword

			T	R	A	N	S	V	E	R	S	A	L	
										O				
	S	C	A	L	E					T				
		E				B		P		A	C	U	T	E
I		N		R		I		E		T				
N	E	T		E		S		N		I				
V		R	E	F	L	E	C	T	I	O	N			
A		E		L		C		A		N	O	R	T	H
R			W	E	S	T		G			N			
I				X		O		O	C	T	A	G	O	N
A						R		N			G		B	
N			E							S	O	U	T	H
T	R	I	A	N	G	L	E				N		U	
			S										S	
H	E	P	T	A	G	O	N			R	U	L	E	R

Page 86 Geometry Review

1. a = acute, b = reflex, c = right

2. d = 33°, e = 51°

3. f = 54°

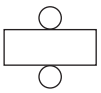
4. g = 123°, h = 57°, i = 57°

5. j = 102°, k = 35°, p = 78°, m = 125°, n = 55°

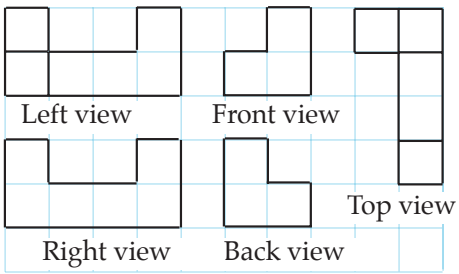
6. 225°

7. 135°

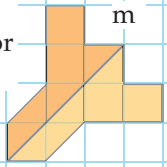
8.



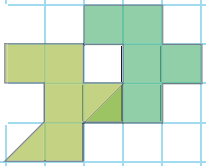
9.



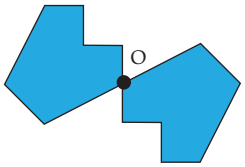
10. Reflect the figure in the mirror line m.



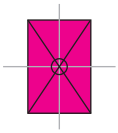
11. Move the figure 2 units left and 1 down.



12.



13.



Order of rotational symmetry is 2.

Statistics

Page 88 Collecting Data 1

Teacher marked

Page 89 Collecting Data 2

Teacher marked

Page 90 Frequency Tables

1.

Results	Tally	Freq.
1	𝍸 |||	9
2	𝍸 𝍸	10
3	𝍸 ||	7
4	||	3
5	|	2
6	|	1
		32

2. 32 students

3. $\frac{9}{32}$ (0.28)

4. $\frac{13}{32}$ (0.41)

5. 19 out of 32 is not almost all. Approx. 40% come from households with 3 or more children.

6.

Matches	Tally	Freq.
45	|||	4
46	||	3
47	𝍸	5
48	|||	4
49	|	1
50	|||	4
51	|	2
52	|||	4
53	||	3
		30

7. 30

8. $\frac{17}{30}$

9. 12 out of 30 (0.40)

10. Maybe true but in this survey most of the boxes had less than 50 matches. Accept No or suspect.

Page 91 Mean, Median, Mode and Range

1. mean = 15.2, median = 10,
mode = 9, range = 31

2. mean = 28.4 (1 dp), median = 28
mode = 29, range = 34

3. mean = 4.15, median = 4.12,
mode = no mode, range = 3.44

4. mean = 26.2 (1 dp), median = 24,
mode = 0, range = 100

Problem Solving

She must score 50

Page 92 Mean, Median, Mode and Range (Grouped Data)

1. mean = 22.7 (1 dp), median = 23
mode = 23, range = 5

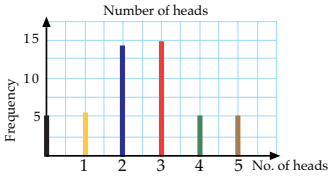
2. Generally median, but mean okay in this instance because there are not extreme values.

3. mean = 2.5 (1 dp), median = 2.5
mode = 2 and 3, range = 5

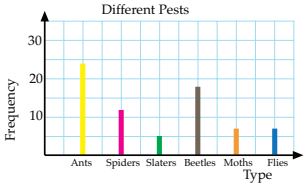
4. In line with expectation of between 2 and 3.

Page 93 Bar Graphs

1.



2.



3. Fred

4. Cleo and Ed

5. $46

6. $14

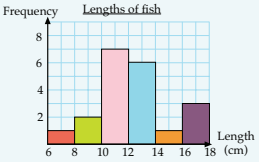
7. $7.50

Communication problem

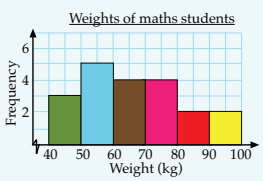
Median of 10 as most of the time he gets a score close to this.

Page 94 Histograms

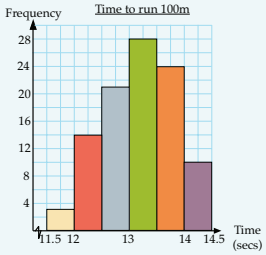
1.



2.



3.



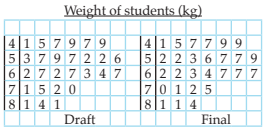
4. 17

5. About 13 seconds

6. 100

Page 95 Stem and Leaf Plots

1.

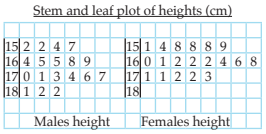


median = 62, LQ = 52, UQ = 70

2. IQR = 18

3. 14 students

4.

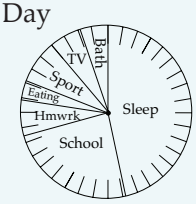


Male med = 169 Male LQ = 164 Male UQ = 176
Female med = 162 Female LQ = 158 Female UQ = 171

Communication Problem
Males are generally taller than the females. The male median, UQ and LQ are all greater than their female equivalents.

Page 96 Pie Graphs

1. Adam's Typical Day



2. Food = $\frac{1}{6}$

3. Rent and home = $\frac{1}{3}$

4. $760

5. Electricity, rates, phone etc.

Application Problem

Teacher marked

Page 97 Box and Whisker Plots / Pictographs

1. 55

2. 50

3. 85

4. males

5. 53 to 55

6. Joe Brown's property

Goats	
Cattle	
Pigs	
Dogs	
Ducks	
Key	= 5 animals

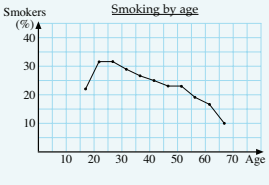
7. Visual appeal

8. 0.16

Page 98 Time Series / Line Graphs

1. A = bath being filled
B = child getting undressed
C = getting in bath
D = splashing around
E = emptying water out or getting out
F = adding more hot water
G = emptying the bath

2.

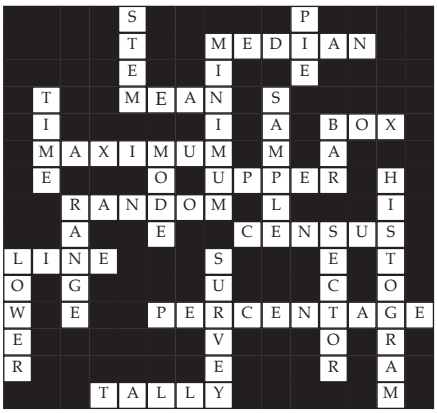


3. 28%

4. 21 and 31 years of age

Communication Problem
Smokers are dying at a greater rate so smaller proportion in the population.

Page 99 Statistics Crossword



Page 100 Statistics Review

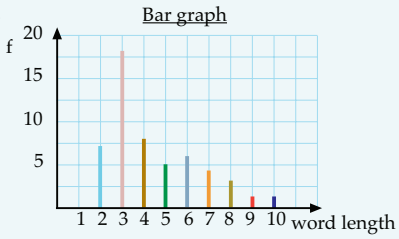
1. First paragraph could be different or unusual

2.

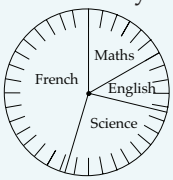
Lgth.	Tally	f	fx	Lgth.	Tally	f	fx
1				6	𝍸 I	6	36
2	𝍸 | |	7	14	7	| | | |	4	28
3	𝍸 𝍸 𝍸 | | |	18	54	8	| |	3	24
4	𝍸 | |	8	32	9	|	1	9
5	𝍸	5	25	10	|	1	10
					Total	53	232

3. mean = 4.4, median = 4, mode = 3, range = 8

4.



5. Gail's Day

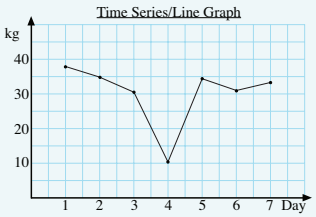


6.

Stem and leaf plot of weights (kg)

1	3	4	4	7	8	8			
2	1	1	2	3	3	3	3	3	
3	2	5	6	6	7	8	9	9	
4	1	2	2	2	5				
5	0	3							
6	1	2	2	2	4	4	6		
7	0	1	1	2	3	3	5		
8	1	2							

7.



8. Day 4

Probability

Page 102 Probability Concepts

1. A, P, O, B

2. a) R, G, B

b) RR, RG, RB, BR, BG, GG, GR, GB

3. BBB, BGB, BBG, BGG, GBB, GBG, GGB, GGG

a) 8

b) 3

c) 7

4.

	1	2	3	4	5	6
1	1,1	1,2	1,3	1,4	1,5	1,6
2	2,1	2,2	2,3	2,4	2,5	2,6
3	3,1	3,2	3,3	3,4	3,5	3,6
4	4,1	4,2	4,3	4,4	4,5	4,6
5	5,1	5,2	5,3	5,4	5,5	5,6
6	6,1	6,2	6,3	6,4	6,5	6,6

a) 36

b) 6

c) 10

5. a) HO, HX, TO, TX

b) 4

c) 3

Problem Solving

Page 103 Relative Frequency

1. a) 100

b) $\frac{32}{100}$

c) $\frac{20}{100}$

d) $\frac{57}{100}$

e) $\frac{200}{800}$

1. f) $\frac{1}{4}$

g) Experimental Probability

2. a) 60

b) $\frac{27}{60}$

c) $\frac{8}{60}$

2. d)

Leg	Head	Body	Eye	Ant.
400	200	200	200	200

e)

Leg	Head	Body	Eye	Ant.
$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

Problem Solving

$47 - 10 + 9 - 5 - 4 - 1 = 36$

Page 104 Predicting Probability

1. a) $\frac{1}{6}$

b) $\frac{1}{3}$

c) 0

d) 1

2. a) $\frac{3}{13}$

2. b) $\frac{1}{2}$

c) $\frac{1}{26}$

3. a) $\frac{4}{11}$

b) $\frac{6}{11}$

3. c) $\frac{6}{11}$

d) 0

4. a) $\frac{7}{20}$

b) $\frac{1}{2}$

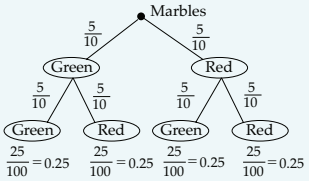
c) $\frac{3}{10}$

Application Problem

Expect perhaps 10 of each number. Unlikely from an experiment that only involves 60 trials.

Page 105 Tree Diagrams

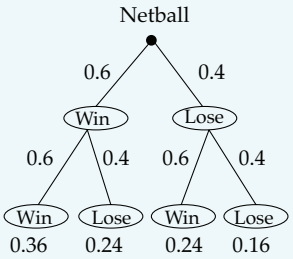
1. a)



b) P(two red) = 0.25

c) P(red - green) = 0.25

2. a)



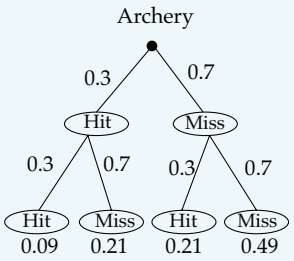
b) WW, WL, LW, LL

c) 0.4

d) 0.16

e) 0.48

3.



P(hits both arrows) = 0.09

Problem Solving

Answer = 20
(Odd total 400, even 380)

Page 106 Probability Crossword

T	R	E	E	D	I	A	G	R	A	M				
		X					E				R		P	
E	X	P	A	N	D	I	N	G		L		A	K	E
Q		E					U		E		N		R	
U		R		F			L		A		G		P	
A		I		A			S	A	M	P	L	E		I
T		M		C	E	N	T	R	E		E			N
I		E		T			R		D		S			D
O		N		O			A		I		S			I
N		T		R			I		A					C
	F						G		N	U				U
	A						H	T						L
M	I	D	N	I	G	H	T							A
	R							U	N	F	A	I	R	

Page 107 Probability Review

1. a) T, D, H, C, S

b) 9

c) $\frac{1}{5}$

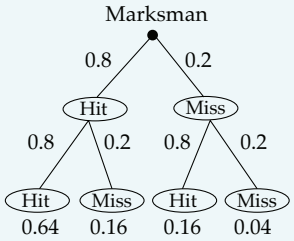
2. a) $\frac{6}{15}$

b) $\frac{7}{15}$

c) $\frac{13}{15}$

d) $\frac{5}{15}$

3. a) 80



b) 0.2

c) 0.64

4. a) 36

b) 3

c) $\frac{6}{36}$

d) $\frac{5}{36}$

e) 11

5. a) $\frac{1}{5}$

b) 6

c) Greater than 10 may indicate need to retest.

6. $\frac{3}{120}$

7. $\frac{10}{30}$

Problem Solving

Page 108 Guess and Check

1. 1 x 9 + 9 x 8 = 81

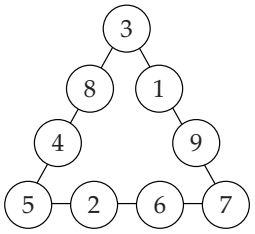
2.

8	1	6
3	5	7
4	9	2

3. 2 x 31 + 49 = 111
so answer = 31

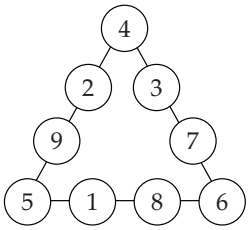
4. 263

5. More than 1 answer.



Variations possible

5. cont...
Check corners add to 15 and all numbers are used.



6. 9

Page 109 Simplify the Problem

1. 42 (there must be 42 losers)

2. 2 (start with 3 on each side)

3. 1024 (if it was possible to fold it 10 times)

4. 74 savouries

5. 26

Page 110 Look for a Pattern

1. 4 + 3 + 2 + 1 = 10

2. 4 x 3 x 2 x 1 = 24

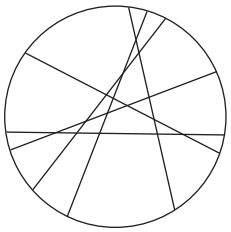
3. 1 + 2 + 4 + 8 + 16 = 31

4. Friday (60 days time).

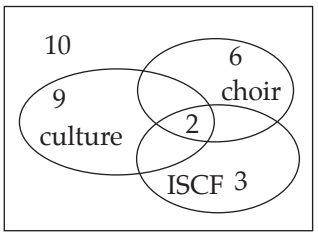
5. 1 + 4 + 9 + 16 + 25 + 36 = 91

Page 111 Make a Model or Diagram

1. 1+1+2+3+4+5+6=22



2. 10 students



3.

1001	111	515	629
1111	121	525	659
1221	151	555	906
1551	202	010	916
2002	212	020	926
2112	222	050	956
2222	252	609	
101	505	619	

4. 325 people excluding Matthew

5. 7 cuts giving 8 bracelets of 24 links.

Page 112 Make a Table

1. 6

2. 9 ways

$2	$1	50c	10c
1			
	1	2	
	1	1	5
	1		10
		4	
		3	5
		2	10
		1	15
			20

3. All $2.50 with 15 coins.

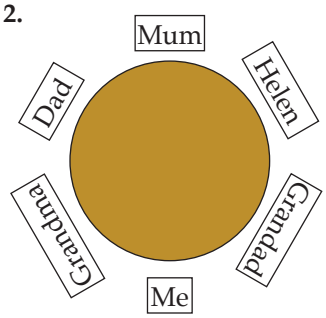
$1	50c	20c	10c
1		1	13
	1	6	8
	2	2	11
		10	5

4. 9

Page 113 Use Logic

1. Today is 1st Jan. The birthday is 31st December.

2.



3. *There are no errors in this sentence.* There were four errors the three spelling mistakes and the number for (four).

4.

16	2	3	13
5	11	10	8
9	7	6	12
4	14	15	1

5. Sylvia was 8 when Jane's brother was 12. He is now 16.

Page 114 Use Algebra

1. 13, 14, 15, 16, 17

2. length = 9 metres

Area = 34 m^2

3. 8 employees

4. 44 years

5. 21 items

Page 115 Work Backwards

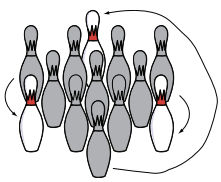
1. 40 wine gums (20, 10, 5, and 5)

2. number = 9

3. $250

4. 26th day of the month (6 extra lots of 5)

5.



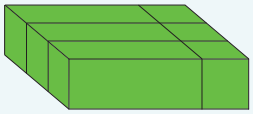
6. Best strategy is work backwards

Page 116 Problem Solving Review

1. 9 internal and 1 overseas.

2. Aroha spent $70 and Barbara spent $80.

3. Cut $\frac{1}{4}$ along the length.



4. gas costs $6 (and the bottle costs $86)

5. 3 units by 6 units.

6. 20

7. 5, 6, 7, 8

8. Matthew had 7 and Sam 5.