Counting in multiples Page 8

Ruby

1 **a** Add four Accept +4

b Add eight Accept +8

c Add fifty Accept +50

2 **a** Missing numbers are: 60, 80, 100

b Missing numbers are: 300, 400, 600

c Missing numbers are: 24, 48, 56

d Missing numbers are: 20, 28, 32, 36

3 24, 30, 36, 42

Pearl

1 **a** Add six Accept +6

b Add seven Accept +7

c Add twenty-five Accept +25

d Add one thousand Accept +1,000

2 **a** Missing numbers are: 84, 91

b Missing numbers are: 250, 275, 300

c Missing numbers are: 42, 48, 60, 66

3 56

4 108

Diamond

1 There is a pattern for multiples of 25.

The tens and ones always end in (cycle through): 00, 25, 50 and 75.

5,175 ends in 75

2 105

3 114 will not divide exactly by 7 so repeated adding of 7 will never generate a number that is divisible by 7.

4 362 is incorrect.

351 + 11 = 362

If 9 had been added, this would give 351 + 9 = 360

The sequence would be correct.

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Working with larger numbers Page 9

Ruby

1 **a** <

b <

c >

2 **a** 904

b 522

c 299

d 506

3 653, 635, 563, 536, 356

Pearl

1 **a** >

b <

c >

2 9,934

3 **a** 7,564, 7,456, 6,864, 6,856, 6,845

b 9,030, 8,320, 7,435, 6,934, 5,932

c 8,953, 8,935, 8,593, 8,395, 8,359

Diamond

1 **a** 8,742

The digits must be in order, largest first so they have the greatest place value.

b 2,478

The digits must be in order, smallest first so they have the least place value.

2 Both numbers have five thousands, the next most significant digit is the value of the hundreds.

In 5,841 the value of the hundreds is eight hundreds.

In 5,481 the value of the hundreds is four hundreds.

5,841 > 5,481

3 5,894 + 100 = 5,994

6,784 + 1,100 = 7,884

3,581 + 1,000 = 4,581

Only 4,581 has increased by 1,000.

Only the thousands digit has increased by 1.

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Place value Page 10

Ruby

1 **a** four tens Accept 40

b four ones Accept 4 or four units

c four hundred Accept 400

2 352

3 135

4 4,763

5 9,321

6 894

Pearl

1 **a** Four tens Accept 40

b Four hundred Accept 400

c Four thousand Accept 4,000

2 4,734

3 3,847

4 **a** 34

b 97

c 66

Diamond

1 Both numbers have four thousands, the next most significant digit is the value of the hundreds.

In 4,825 the value of the hundreds is eight hundreds.

In 4,258 the value of the hundreds is two hundreds.

4,825 > 4,258

2 The first two numbers have five thousands and seven hundreds, the next most significant digit is the value of the tens.

In 5,734 the value of the tens is three tens or thirty.

In 5,724 the value of the tens is two tens or twenty.

5,734 > 5,724

All three numbers have five thousands, the next most significant digit is the value of the hundreds.

In 5,734 the value of the hundreds is seven hundreds.

In 5,834 the value of the hundreds is eight hundreds.

5,736 < 5,834

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3 Many possible answers, e.g.

8,210 + 6

8,000 + 216

8,006 + 210

4,000 + 4,216

4 4,953

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Representing numbers Page 11

Ruby

1 700

2 90, 7

3 560

4 507

5 174

6 940

Pearl

1 300, 9

2 4,258

3 400

4 5,060

5 8,600

Diamond

1 **a** Correct, 3,200 is 32 hundreds.

b Incorrect, 3,200 is 320 tens not 32 tens.

c Correct, 3,200 is 3,200 ones.

d Incorrect, 3,200 is 3,200 ones not 320 ones.

2 Many possible answers, e.g.

7,000 + 285

7,200 + 85

7,205 + 80

7,005 + 280

1,000 + 6,285

3 Dan has written the significant digits in the order that they have been written, instead of their value.

The correct answer should be 8,354.

4 206 Accept 215

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Rounding numbers Page 12

Ruby

1 **a** 80

b 570

c 5,090

2 **a** 800

b 3,100

c 8,000

d 2,200

3 **a** 8,000

b 4,000

c 10,000

d 12,000

Pearl

1 **a** 40,900

b 7,000

c 54,900

2 **a** 9,000

b 63,000

c 40,000

3 18,000

Diamond

1 Mia needs to look at the column to the right of the thousands column.

5,199 rounded to the nearest 1,000 would be 5,000.

The 1 in the hundreds column tells you to round down.

2 The smallest number is 6,250.

Any smaller number rounded to the nearest hundred would be 6,200.

3 The largest number is 54,499.

54,500 rounded to the nearest thousand would be 55,000.

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Negative numbers Page 13

Ruby

1 **a** –1

b –4

2 **a** –6

b 0

3 **a** –4

b 0

c –3

d –8

e –1, –2

f –9, –10

Pearl

1 **a** –2, –4

b –10, –12

2 **a** –8, –10

b –15, –20

3 –2 °C

4 –6 °C

5 –4, –2, 0, 3, 5

Diamond

1 –2

2 Addition can be done in any order, but subtraction cannot, so Ben is incorrect.

0 – 4 = –4 4 – 0 = 4

0 + 4 = 4 4 + 0 = 4

3 –10 °C

4 6 m

Ben dives 3 m from the board to the water and then another 3 m under the water.

3 m + 3 m = 6 m

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Addition

Page 14

Ruby

1 **a** 630

b 900

2 **a** 607

b 1,178

c 1,200

d 1,354

3 325 (rings)

4 991

5 929

Pearl

1 **a** 6,500

b 7,100

2 **a** 9,207

b 8,054

3 7,419 (rings)

4 14,133

Diamond

1 **a** 192

b 886

2 **5**7**2** + 6**3**4 = 1,206

3 **a** 563 The largest total would be 797, this gives the missing number as 563.

b 473 The smallest total would be 707, this gives the missing number as 473.

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Subtraction Page 15

Ruby

1 **a** 190

b 620

2 **a** 206

b 459

c 349

d 392

3 211 (people)

4 138 (t-shirts)

Pearl

1 **a** 6,700

b 4,600

2 **a** 4,262

b 3,476

c 3,506

3 168 (pupils)

4 1,757

5 884 (passengers)

Diamond

1 **a** 808

b 5,943

2 **572** – 1**7**9 = 393

3 **a** 636 The largest answer would be 394, this gives the missing number as 636.

b 546 The smallest answer would be 304, this gives the missing number as 546.

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Checking addition and subtraction Page 16

Ruby

1 **a** 60 + 80 = 140

b 90 – 20 = 70

c 30 + 80 = 110

2 **a** 400 + 500 = 900

b 900 – 200 = 700

c 700 – 400 - 300

3 **a** 968 – 732 = 236 Accept 968 – 236 = 732

b 526 + 292 = 818

c 866 – 293 = 573 Accept 866 – 573 = 293

d 604 + 148 = 752

Pearl

1 **a** 600 – 400 = 200

b 900 + 700 = 1,600

2 **a** 7,000 + 6,000 = 13,000

b 9,000 – 4,000 = 5,000

3 **a** The calculation is incorrect.

9,719 – 5,443 = 4,276 Accept 9,719 – 4,376 = 5,343

b The calculation is correct.

8,663 – 1,467 = 7,196 Accept 8,663 – 7,196 = 1,467

c The calculation is incorrect.

5,853 + 2,184 = 8,037

Diamond

1 Pat has added 8,654 and 3,452.

2 Use the inverse to find the missing number.

4,000 – 2,500 = 1,500

The missing number is 1,500.

3 **a** The calculation is incorrect.

3,337 + 2,491 = 5,828

The correct calculation is 5,728 – 2,491 = 3,237

b The calculation is incorrect.

8,351 – 4,736 = 3,615 Accept 8,351 – 3,625 = 4,726

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The correct calculation is 3,625 + 4,736 = 8,361

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Addition and subtraction problems Page 17

Ruby

1 73 (cards)

2 (£)51

3 465

4 (£)49

Pearl

1 256 (km)

2 (£)3,740

3 7,007

4 1,499 (seats)

Diamond

1 1,250 and 3,750

2 4,500

3 The addition and subtraction values are unchanged and so the answer is not affected.

The order is not important.

(Unlike 4 – 3 and 3 – 4, where the values of the number being subtracted changes.)

4 2,999 + 3,000 + 3,001 = 9,000

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Multiplication and division facts Page 18

Ruby

1 15
2 24
3 18
4 30
5 28
6 50
7 72
8 7
9 5
10 5
11 7
12 2
13 7
14 9
15 10
16 3
17 40
18 8
19 60
20 1

Pearl

1 24
2 27
3 42
4 7
5 9
6 9
7 8
8 8
9 7
10 99
11 12

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12 6

13 9

14 7

15 11

Diamond

1

×	**4**	**6**	**3**	**7**
5	20	30	15	35
8	32	**48**	**24**	**56**
2	**8**	12	**6**	**14**
9	**36**	**54**	27	**63**

2 **a** 240

b 2,400

c 2,400

d 4

e 400

3 Accept any two numbers that multiply to 48, e.g.

1×48

2×24

3×16

4×12

6×8

4.8×10

$\frac{1}{2} \times 96$

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Multiplying mentally Page 19

Ruby

1 **a** 1
b 0
c 0
d 11
e 1
2 **a** 5
b 2
3 **a** 48
b 17

Pearl

1 **a** 20
b 12
c 6
d 96
2 **a** 16
b 50
c 8, 12
3 **a** 6
b 6
c 6
d 6
4 272
5 18

Diamond

1 Accept any two numbers that multiply to 24, e.g.

1×24, 2×12, 3×8, 4×6, 2.4×10, $\frac{1}{2} \times 48$

2 1×4 or 2×2

3 **a** 7
b 14
c 21
d 28

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4 68

5 **a** 5

b 50

c 500

d 5,000

e 50,000 ÷ 5 = 10,000

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Written methods of multiplication Page 20

Ruby

1 60

2 54

3 135

4 136

5 159

6 112

7 112

8 138

9 388

Pearl

1 292

2 516

3 455

4 512

5 1,096

6 2,190

7 2**4**3 × 5 = 1,215

8 **4**3**3** × 7 = 3,031

Diamond

1 251 × 6 = 1,506 so Tom is not correct.

2 **3**94 × **9** = 3,546

3 146 × 8 is one more eight than 145 × 8 so 146 × 8 = 1,160 + 8 = 1,168

4 360 × 2 = 720 360 × 8 = 2,880

720 × 2 = 1,440

1,440 × 2 = 2,880 Doubling 360 three times and multiplying 360 by 8 both give the same answer.

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Multiplication problems Page 21

Ruby

1 (£)25

2 60 (kg)

3 144 (km)

4 **a** 1 × 12, 2 × 6, 3 × 4

b 1 × 20, 2 × 10, 4 × 5

5 (£)35

6 (£)4

7 96

Pearl

1 315 (minutes)

2 2,100 (ml)

3 40, 6

4 **a** 1 × 32, 2 × 16, 4 × 8

b 1 × 48, 2 × 24, 3 × 16, 4 × 12, 6 × 8

5 **a** 550 (g)

b 825 (g)

Diamond

1 1,175 (counters)

2 945 (counters)

3 There are different possible answers, e.g.

2 t-shirts and 7 pairs of shorts

4 t-shirts and 4 pairs of shorts

6 t-shirts and 1 pair of shorts.

4 2,400 (ml)

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Hundredths Page 22

Ruby

1 $\frac{3}{10}$

2 $\frac{7}{10}$, $\frac{5}{10}$

3 $\frac{3}{10}$, $\frac{9}{10}$

4 **a** $\frac{1}{10}$

b $\frac{7}{10}$

Pearl

1 **a** $\frac{29}{100}$

b $\frac{84}{100}$

c $\frac{98}{100}$, $\frac{100}{100}$ Accept $\frac{98}{100}$, 1

2 **a** $\frac{1}{100}$

b $\frac{3}{100}$

c $\frac{7}{100}$

3 **a** $\frac{3}{100}$

b $\frac{7}{100}$

Diamond

1 1

2 **c** and **d** indicated only.

3 **a** 100

b 10

c 100

d 10

4 $\frac{1}{10}$ and $\frac{10}{100}$ are the same.

Accept diagrams, finding $\frac{1}{10}$ or $\frac{10}{100}$ of a number or equivalent or simplified fractions as a way of explaining $\frac{1}{10}$ and $\frac{10}{100}$ are the same.

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Equivalent fractions Page 23

Ruby

1 $\frac{5}{8}$

2 **a** 2

b 10

Pearl

1 **a** 2

b 8

c 4

d 3

2 6, 12, 10, 18

3 **a** 21

b 21

Diamond

1 Accept any three fractions equivalent to $\frac{3}{4}$, e.g. $\frac{6}{8}$, $\frac{9}{12}$, $\frac{12}{16}$, $\frac{15}{20}$ …

2 **a** > because $\frac{7}{10} = \frac{14}{20}$ and $\frac{17}{20} > \frac{14}{20}$

b > because $\frac{7}{12} = \frac{14}{24}$ and $\frac{17}{24} > \frac{14}{24}$

3 2, 32

4 Accept any three fractions equivalent to $\frac{2}{5}$, e.g. $\frac{4}{10}$, $\frac{6}{15}$, $\frac{8}{20}$, $\frac{10}{25}$ …

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Adding and subtracting fractions Page 24

Ruby

1 **a** $\frac{3}{8} - \frac{2}{8} = \frac{1}{8}$

b $\frac{3}{8} + \frac{4}{8} = \frac{7}{8}$

c $\frac{9}{10} - \frac{6}{10} = \frac{3}{10}$

2 **a** $\frac{1}{8}$

b $\frac{7}{8}$

c $\frac{3}{10}$

Pearl

1 **a** $\frac{11}{12}$

b $\frac{5}{12}$

c $\frac{8}{5} = 1\frac{3}{5}$ Accept either answer if given alone.

d $\frac{3}{10}$

e $1\frac{1}{2}$

f $\frac{5}{12}$

2 $\frac{5}{8}$

3 $\frac{5}{12}$

Diamond

1 Max has added the denominators.

Any denominator could be used, e.g.

$\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}$

2 **a** 4

b 3

3 Yes, Polly is correct.

You only add the numerators, the denominators only name the fraction for addition and subtraction.

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Finding fractions

Page 25

Ruby

1 Any 2 sections shaded.

2 Any 2 sections shaded.

3 3 (litres)

4 (£)10

5 5 (children)

Pearl

1 24

2 30

3 21

4 22

5 21 (calculations)

6 12 (boys)

Diamond

1 20

2 60

3 45

4 18 (counters)

5 25

6 12

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Fraction and decimal equivalents Page 26

Ruby

1 **a** **i** $\frac{1}{2}$ **ii** 0.5

b **i** $\frac{1}{4}$ **ii** 0.25

c **i** $\frac{3}{4}$ **ii** 0.75

d **i** $\frac{4}{8}$ **ii** 0.5

e **i** $\frac{5}{10}$ **ii** 0.5

f **i** $\frac{1}{10}$ **ii** 0.1

g **i** $\frac{9}{10}$ **ii** 0.9

h **i** $\frac{7}{10}$ **ii** 0.7

2 0.3

3 $\frac{7}{10}$

Pearl

1 **a** $\frac{23}{100}$

b $\frac{53}{100}$

2 **a** 0.57

b 0.91

3 **a** 1.3

b 3.5

4 $\frac{1}{4}$

Diamond

1 7, 7

2 1.4 has a whole number, but $\frac{1}{4}$ is a part of one whole.

3 0.2 is $\frac{2}{10}$.

$\frac{2}{10}$ is equivalent to $\frac{1}{5}$.

4 Dan has used 0.4, this is equivalent to $\frac{4}{10}$.

$\frac{1}{2}$ is equivalent to $\frac{5}{10}$.

Dan is incorrect.

5 Accept solutions for which the sum of the fractions is equivalent to 0.73.

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Rounding decimals Page 27

Ruby

1 7

2 8

3 8

4 7

5 7

6 10

7 2

8 9

9 21

10 26

Pearl

1 **a** 6

b 33

c 100

d 73

e 101

2 10 (litres)

3 30 (kg)

Diamond

1 **a** 14.5

b 15.4

2 5.7 or 5.73

3 270 + 80 = 350

4 2 (metres)

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Comparing decimals Page 28

Ruby

1 **a** <

b >

c <

d <

2 **a** 2.5, 8.8, 15.1

b 12.8, 13.8, 14.8

c 3.56, 35.6, 356

d 29.7, 77.6, 100

Pearl

1 **a** >

b >

c <

2 **a** 2.98, 5.67, 6.54

b 19.79, 20.09, 20.98

3 **a** 45.5 kg, 45.7 kg, 46.1 kg

b 4.68 m, 4.74 m, 4.76 m

4 2.9 m

Diamond

1 Accept any number >5,61, <5.7, e.g. 5.65

2 Both numbers have 1 ten, 12.1 has 2 ones, 11.9 has only 1 one.

12.1 must be the larger number.

3 Dan has put 4.5 as the smallest number. 4.5 is the largest number.

4 The number of digits in a number is not important, Gail needs to think about the value of the digits.

13.5 has 1 ten and 3 ones.

12.56 has 1 ten and 2 ones, so 12.56 is the smaller number.

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Dividing by 10 and 100 Page 29

Ruby

1 **a** 0.05

b 0.12

c 0.06

d 0.8

e 0.42

f 0.08

2 0.3 (litres) Accept 300 (millilitres)

3 (£)0.40 Accept 40(p)

Pearl

1 **a** 0.57

b 0.08

c 0.037

2 1 (kg)

3 No, (£)4 ÷ 100 = (£)0.04 or 4(p)

There are no 4p coins.

4 **a** 10

b 1

c 100

Diamond

1 0.63

2 Accept any number greater than 5.6 but less than 6, e.g. 5.75

3 Accept any number greater than 60 but less than 70, e.g. 65

4 1,001 indicated only.

5 Ayesha is correct.

1 ÷ 10 = 0.1, 0.1 ÷ 10 = 0.01

1 ÷ 100 = 0.01

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Decimal problems Page 30

Ruby

1 **a** 10.5

b 1.9

c 73.9

d 42.5

e 58.05

f 28.06

2 (£)3.04, (£)3.40, (£)4.03, (£)4.30

3 (£)2.99

4 (£)10

Pearl

1 **a** 23.12

b 147.29

c 67.25

2 2.26 (m), 2.62 (m), 3 (m), 3.57 (m), 3.75 (m)

3 (£)1.60

4 **a** 18.9 (m)

b 55 (kg)

Diamond

1 Accept a reasonable explanation showing an understanding the calculation is incorrectly set out, e.g.

- The columns have not been used correctly.
- The decimal points should be in a row.
- The value of the digits do not match in the columns.

2 4.5 ÷3 = 1.5 (m)

3 Answers will vary.

Accept any reasonable explanation.

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Comparing measures Page 31

Ruby

1 6.25 (m)

2 6.75 (kg)

3 5,000 (ml)

4 (£)10

5 6.75 (m), 7.5 (m), 8 (m)

6 4 (kg), 3.75 (kg), 3.7 (kg)

Pearl

1 8 (l)

2 (£)12.25

3 7.5 (m), 7.25 (m), 6.75 (m), 6 (m), 5.25 (m)

4 11.75 (kg), 11.8 (kg), 12.25 (kg), 12.5 (kg), 14 (kg)

5 **a** <

b <

c >

Diamond

1 Ali is incorrect.

3,350 (g) is 3.35 (kg) which is not between 3.4 (kg) and 3.5 (kg)

or 3.4 (kg) is 3,400 (g) and 3.5 (kg) is 3,500 (g) and 3,350 (g) does not come between them.

2 5 (m) is shorter than 650 (cm) but not for the reason Zak gives.

The value of the digits alone is not important, the value must be linked to the units of measure.

3 All the measures must be in the same units, e.g. all metres (m).

3 km = 3,000 (m)

2,500 (m)

2,500 (cm) = 25 (m)

When the units are the same use place value to compare the numbers: 3,000 (m) / 3 (km) is the longest.

4 The scales show 500 (g) is heavier than 2 (kg).

This is incorrect.

2 (kg) = 2,000 (g) and is heavier than 500 (g)

OR

500 (g) is 0.5 (kg) and is lighter than 2 (kg)

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Estimate measures Pages 32–33

Ruby

1 **a** Bag of sugar 1,000 (g)

b Orange 200 (g)

c Bag of crisps 30 (g)

d Ketchup 500 (g)

2 **a** Bucket 12 (litres)

b Can 330 (millilitres)

c Bottle 500 (millilitres)

d Petrol can 5 (litres)

3 Accept any weight, in grams, greater than 2,000 (g) but less than 3,000 (g).

4 150 (g)

5 80 (litres)

6 2 (m)

7 3.5 (kg)

8 300 (ml)

9 400 (cm)

Pearl

1 150 (cm)

2 1 litre bottle of water

3 The length of a football field

4 A mug

5 > 1 litre

6 < 20 litres

7 > 50 mm

8 > 100 grams

Diamond

1 Kira is correct.

A car is between 4 and 5 metres long.

8.95 metres is about twice this length.

2 Ben's idea is correct.

A door is about 2 metres.

6 or 7 rulers would be 180 centimetres to 210 centimetres.

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3 Samir's idea is incorrect.

2 litres is 2,000 millilitres.

If Samir fills 40 glasses, each glass is holding 50 millilitres not 500 millilitres.

4 Jenny's idea is incorrect.

A car weighs about 1,500 to 2,000 kilograms, much more than the mass of 5 suitcases (100 kg).

5 Count number of paces for the length of the school playground.

Multiply the number of paces by the length of one pace.

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12-hour clock Pages 34–35

Ruby

1 **a** 2:00 a.m.

b 5:30 p.m.

c 6:45 p.m.

d 1:40 a.m.

2 **a** 8:15 a.m.

b 7:05 p.m.

c 2:10 p.m.

3 **a** Hands showing 5:15, minute hand longer than the hour hand. Allow some inaccuracy.

b Hands showing 11:30, minute hand longer than the hour hand. Allow some inaccuracy.

c Hands showing 11:00, minute hand longer than the hour hand. Allow some inaccuracy.

Pearl

1	**a**	**i**	twenty past two	Accept 20 past 2	**ii**	2:20 a.m.
	b	**i**	quarter past 6	Accept $\frac{1}{4}$ past 6	**ii**	6:15 p.m.
	c	**i**	twenty to two	Accept 20 to 2	**ii**	1:40 p.m.
	d	**i**	half past eleven	Accept $\frac{1}{2}$ past 11	**ii**	11:30 p.m.
	e	**i**	ten past two	Accept 10 past 2	**ii**	2:10 p.m.
	f	**i**	five past nine	Accept 5 past 9	**ii**	9:05 a.m.

2 **a** quarter past three in the afternoon Accept $\frac{1}{4}$ past 3

b ten to eight in the evening Accept 10 to 8

3 **a** 10:40 a.m.

b 6:05 p.m.

Diamond

1 12:10 p.m.

2 Harry has used a.m. but he should use p.m. for a time in the evening.

3 45 (minutes)

4 **a** Correct

b 9:30 p.m. = half past nine in the morning indicated.

The correct time should be 9:30 in the evening.

c Correct

d 7:50 a.m. = ten to seven in the morning indicated.

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The correct time should be ten to eight in the morning.

5 If the time is 7:70, this would mean 70 minutes past 7.

There are only 60 minutes in an hour so the time has moved 10 minutes past 8 o'clock.

The correct finishing time is 8:10 p.m.

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24-hour time

Pages 36–37

Ruby

1 **a** 07:30 a.m.

b 3:15 p.m.

c 8:20 p.m.

d 02:00 a.m.

e 11:55 a.m.

2 **a** 17:05

b 04:55

c 15:30

d 13:45

e 22:20

Pearl

1	**a**	**i**	ten past nine	Accept 10 past 9	**ii**	09:10
	b	**i**	ten past six	Accept 10 past 6	**ii**	18:10
	c	**i**	half past four	Accept $\frac{1}{2}$ past 4	**ii**	16:30
	d	**i**	five to two	Accept 5 to 2	**ii**	01:55
	e	**i**	twenty-five to twelve	Accept 25 to 12	**ii**	23:35
	f	**i**	eight o'clock	Accept 8 o'clock	**ii**	08:00
2	**a**	**i**	quarter to 7	Accept $\frac{1}{4}$ to 7	**ii**	06:45
	b	**i**	twenty-five past nine	Accept 25 past 9	**ii**	21:25
	c	**i**	twenty to three	Accept 20 to 3	**ii**	02:40
	d	**i**	ten to eight	Accept 10 to 8	**ii**	19:50

Diamond

1 Ben is correct.

14:50 is 2:50 p.m.

2 In 24-hour time, the time 24:15 does not exist as only 24 hours (the length of 1 day) are used.

24:15 should be recorded as 00:15.

3 Bess is incorrect.

35 minutes past 4 means 25 minutes to 5.

16:35 is closer to 5 p.m. than 4 p.m.

4 **a** Correct

b Incorrect

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The correct time is 10:40.

c Incorrect

24-hour time uses 4 digits so the correct time is 08:40.

d Correct

5 There are a number of possible answers.

The digits should total 15, e.g.

23:55

22:36

21:57

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Converting time — Page 38

Ruby

1 120 (seconds)

2 120 (minutes)

3 48 (hours)

4 14 (days)

5 48 (months)

6 240 (minutes)

7 240 (seconds)

8 120 (months)

Pearl

1 42 (days)

2 731 (days)

3 30 (seconds)

4 12 (hours)

5 6 (months)

6 100 (years)

7 12 (months)

8 31 (days)

Diamond

1 3,600 (seconds)

2 24

3 365 ÷ 7 = 52 r 1

There are 52 weeks and 1 day in a year. Accept 366 ÷ 7 = 52 r 2

There are 52 weeks and 2 days in a leap year.

4 15 (days)

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Calculating with time Page 39

Ruby

1 **a** 45 (minutes)

b 40 (minutes)

c 1 hour 15 minutes Accept 75 (minutes)

2 **a** 17:25

b twenty past eight (in the evening)

3 **a** 10:10

b 1:55 p.m.

c ten to twelve in the morning Do not accept ten to twelve in the afternoon.

Pearl

1 **a** 1 hour 25 minutes

b 1 hour 40 minutes

2 **a** Twenty-five to nine in the evening

b 14:45

3 **a** 19:55

b Quarter past ten in the morning

4 6:45 a.m.

Diamond

1 **a** Accept 5 minutes = 300 seconds **or** 5 hours = 300 minutes

b 5 weeks = 35 days

2 There are only 60 minutes in an hour.

Once 60 minutes have passed a new hour is reached.

The correct answer is 11:05.

3 Change the units to minutes:

600 seconds = 10 minutes

$\frac{1}{5}$ of an hour = 12 minutes

The missing number of minutes is 11 (minutes).

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Converting units of measure Pages 40–41

Ruby

1 **a** 20 (mm)

b 60 (mm)

c 80 (mm)

2 **a** 3,000 (g)

b 6,000 (g)

c 8,500 (g)

3 **a** 2,000 (ml)

b 3,000 (ml)

c 4,500 (ml)

4 3,000 (metres)

Pearl

1 **a** 4 (m)

b 5,000 (ml)

c 6 (kg)

d 10 (cm)

e 8,000 (m)

2 1,600 (grams)

3 74 (centimetres)

4 1,650 (millilitres)

5 1,250 (metres)

6 17 cm

Diamond

1 1,000 (millimetres)

2 No

80 cm × 8 = 640 cm

5 m = 500 cm

640 cm > 500 cm

3 No

3 l = 3,000 ml

$1\frac{1}{2}$ l = 1,500 ml

1,500 ml + 800 ml + 800 ml = 3,100 ml

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3,000 ml < 3,100 ml

4 800 (g)

5 No

5 km = 5,000 m

1,000 m takes 3 minutes, so 5,000 m would take (3 minutes × 5) = 15 minutes

15 minutes > 10 minutes

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Calculating with money Page 42

Ruby

1 **a** (£)6.82

b (£)6.87

c (£)29.20

d (£)87.80

2 (£)16.44

3 (£)16.22

4 (£)1.44

Pearl

1 (£)39.60

2 (£)35.35

3 (£)47.35

4 (£)51.45

5 **a** (£)7.97

b (£)6.79

c An adult ticket to Leeds.

Diamond

1 There are several possible answers, e.g.

- £1, 10p, 10p, 10p, 10p, 10p
- 50p, 50p, 20p, 20p, 5p, 5p

2 (£)105

3 Yes

(£)7.50 × 2 = (£)15 (£)6.50 × 2 = (£)13

(£)15 + (£)13 = (£)28

(£)28 < (£)30

4 There are several possible answers, e.g.

- (£)20, (£)20, (£)20, (£)10, (£)5, (£)5
- (£)20, (£)20, (£)10, (£)10, (£)10, (£)10

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Calculating with measures Page 43

Ruby

1 **a** 9.6 (m)

b 0.7 (km)

c 8.2 (kg)

d 14.8 (cm)

2 2.7 (kg)

3 71.2 (km)

4 3.6 (l)

5 1.4 (kg)

Pearl

1 **a** 86.3 (m)

b 43.9 (mm)

c 1,000.6 (kg)

d 16.29 (km)

2 9.2 (kg)

3 0.5 (l)

4 220 (kg)

Diamond

1 Nia is correct.

2 l = 2,000 ml

300 ml × 6 = 1,800 ml

2,000 ml > 1,800 ml

2 No

0.5 m × 10 = 5 m

5 m > 4 m

3 42.60 (m)

4 60 cm and 40 cm Accept 0.6 m and 0.4 m

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Perimeter

Pages 44–45

Ruby

1 **a** 22 (cm)

b 18 (cm)

c 24 (cm)

d 34 (cm)

e 28 (cm)

f 56 (cm)

2 **a** 28 (cm)

b 48 (cm)

c 60 (cm)

3 50 (cm)

Pearl

1 **a** 26 (cm)

b 30 (cm)

c 44 (cm)

d 60 (cm)

e 100 (cm)

2 32 (cm)

3 80 (cm)

4 **a** 18 (cm)

b 20 (cm)

c 20 (cm)

Diamond

1 12 (cm)

2 48 (cm)

3 A length is two widths.

The perimeter is made up of 6 widths.

12 (cm) ÷ 6 = 2 (cm)

2 (cm) × 2 = 4 (cm)

4 Accept

- 9 (cm) × 1 (cm)
- 8 (cm) × 2 (cm)

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- 7 (cm) × 3 (cm)
- 6 (cm) × 4 (cm)
- 5 (cm) × 5 (cm)

Accept answers with decimals and fractions if correct.

5 No

Accept a counter-example, e.g.

A rectangle 4 cm long and 2 cm wide has a perimeter of 12 cm.

12 is an even number.

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Area

Pages 46–47

Ruby

1 8 (cm^2)

2 10 (cm^2)

3 12 (cm^2)

4 12 (cm^2)

5 21 (cm^2)

6 16 (cm^2)

7 13 (cm^2)

8 20 (cm^2)

9 25 (cm^2)

10 14 (cm^2)

Pearl

1 8 (cm^2)

2 16 (cm^2)

3 10 (cm^2)

4 16 (cm^2)

5 12 (cm^2)

6 12 (cm^2)

7 14 (cm^2)

8 13 (cm^2)

9 10 (cm^2)

10 11 (cm^2)

Diamond

1 Accept rectangles with these lengths and widths in either order:

12 (cm) × 1 (cm)

6 (cm) × 2 (cm)

4 (cm) × 3 (cm)

Do not accept answers using decimals or fractions.

2 5 (cm)

3 27 (cm^2)

4 26 (cm^2)

5 7 (cm)

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Compare and classify 2-D shapes Pages 48–49

Ruby

1 **a** and **b**

2 **a** and **e**

3 **c** and **d**

Pearl

1 **b** and **c**.

2 scalene triangle

obtuse-angled triangle

3 **a** and **d**

4 octagon

5 parallelogram, kite

6 square, rectangle

7 **a** and **d**

Diamond

1 It is a square because it has 4 right angles and all sides are equal.

The position of a shape does not affect its properties.

2 Yes

All obtuse-angled triangles have an angle larger than a right angle.

3 A rhombus is an irregular shape because its angles are not all equal.

4 **a** always true

b sometimes true

When a rectangle is a square, its diagonals will cross at right angles.

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Symmetry Pages 50–51

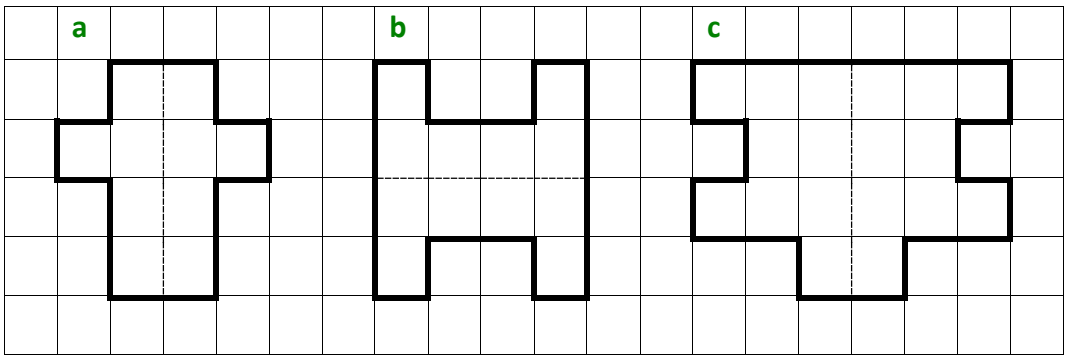
Ruby

1 rectangle **A** and **B**

trapezium **D**

isosceles triangle **G**

2



Pearl

1 **a** 2

b 0

c 0

d 1

e 2

2 **a** rectangle

b pentagon

c kite

d rectangle

e triangle (isosceles and acute-angled)

Diamond

1 No

A rectangle only has two lines of symmetry; its diagonals are not lines of symmetry.

2 No

If the shape was folded along the dotted line, the two halves would not fit exactly over each other.

3 Sometimes true

4 Sometimes true (equilateral triangles have 3 lines of symmetry)

5 20

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Angles Pages 52–53

Ruby

1 **a** 4

b 5

c 3

2 A three-quarter turn

3 **a** Greater than a right angle

b Less than a right angle

c Less than a right angle

d A right angle

e Greater than a right angle

f Less than a right angle

Pearl

1 **a**

2 **b**

3 **c, a, b**

4 **a** and **c**

5 **a** and **c**

Diamond

1 4

2 Yes

Two right angles make a straight angle.

An obtuse angle is greater than a right angle, but less than a straight angle.

3 Sometimes true

Two smaller acute angles may be less than a right angle, but two larger acute angles could be larger than a right angle.

4 Never true

Every obtuse angle is greater than a right angle, so two obtuse angles must always be greater than two right angles.

5 No

An obtuse angle alone is always greater than a right angle so could not be used to make a right angle.

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Coordinates Pages 54–55

Ruby

1 **a** *A* (2, 9)

b *B* (8, 6)

c *C* (3, 4)

d *D* (9, 2)

e *E* (4, 8)

2 **a** Point *F* drawn at (9, 8)

b Point *G* drawn at (1, 2)

c Point *H* drawn at (6, 1)

d Point *I* drawn at (5, 6)

e Point *J* drawn at (7, 9)

Pearl

1 **a** *A* (5, 2)

b *B* (3, 4)

2 **a** Point *C* drawn at (1, 3)

b Point *D* drawn at (4, 5)

3 (2 ,4)

4 (4, 2)

5 (2, 3) or (3, 4) or other fractional coordinates

6 (2, 3)

7 Accept any of:

- (1, 5)
- (5, 5)
- Any coordinate with an *x*-coordinate of 3, except (3, 1).

Also accept:

- (1, –3)
- (5, –3)

Diamond

1 (12, 13)

2 (13, 12)

3 (13, 22) and (21, 22) **or** (13,18) and (21,18)

4 (20, 26) and (23, 26) **or** (20, 20) and (23, 20)

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5 (14, 14) and (20, 17)

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Translations Pages 56–57

Ruby

1 **a** 2 right, 2 up

b 5 right, 1 down

c 2 left, 3 down

d 3 left, 4 up

e 7 right, 1 up

2 **a** E to F

b F to H

c G to E

d G to F

e H to E

Pearl

1 **a** 3 left, 2 down

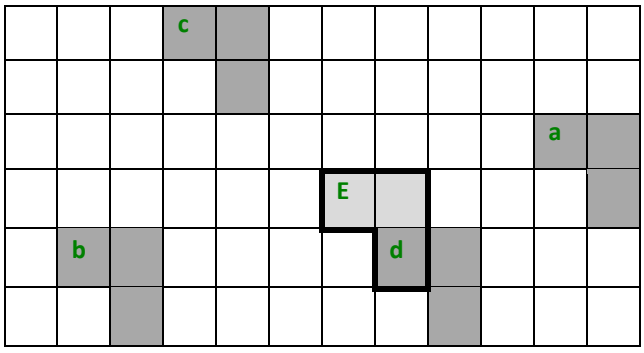
b 7 right, 3 down

c 4 left, 1 up

d 4 up Accept 0 right, 4 up OR 0 left, 4 up

e 7 left, 1 down

2 **a–d**



3 The shape will stay in the same position.

Diamond

1 Ben is incorrect.

There is no reason why a shape cannot 'sit' on another. The shape has just moved.

2 Nia has probably looked at the space between the two shapes.

Nia should focus on one vertex, not the space between them.

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(The correct translation is 2 right, 2 down.)

3 3 left, 4 up

4 (6, 15)

5 (6, 5)

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Pictograms

Pages 58–59

Ruby

1 **a** 4 (letters)

b 10 (letters)

c Monday and Friday

d 4 (letters)

e 8 (letters)

2

School dinners 🍽 represents 2 children	
Hot meal	🍽🍽🍽🍽🍽🍽
Salad	🍽🍽🍽
Sandwich	🍽🍽🍽🍽
Pack lunch	🍽🍽🍽🍽🍽
Home dinner	🍽🍽

Accept inaccuracies in drawing the symbols.

Pearl

1 **a** Ben, Gus, Dev

b 30 (km)

c 50 (km)

2 **a** (£)5,000

b Beth and Gary

c (£)34,000

Diamond

1 **a** 10 (people)

b 15 (people)

2 Accept any reasonable answer and explanation, e.g.

- Symbol = 2 (km) All the distances are even numbers.
- Symbol = 4 (km) All the distances are multiples of 4.

3 **a** 20 (symbols)

b Max should realise that it's not possible to have half a person.

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4

Sunny days	
June	15
July	**25**
August	**10**

In the pictogram, June shows 3 sun symbols and in the table June shows 15.

15 ÷ 3 = 5

1 sun symbol represents 5 sunny days.

July: 5 sun symbols × 5 = 25 days

August: 2 sun symbols × 5 = 10 days

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Bar charts Pages 60–61

Ruby

1 **a** 30

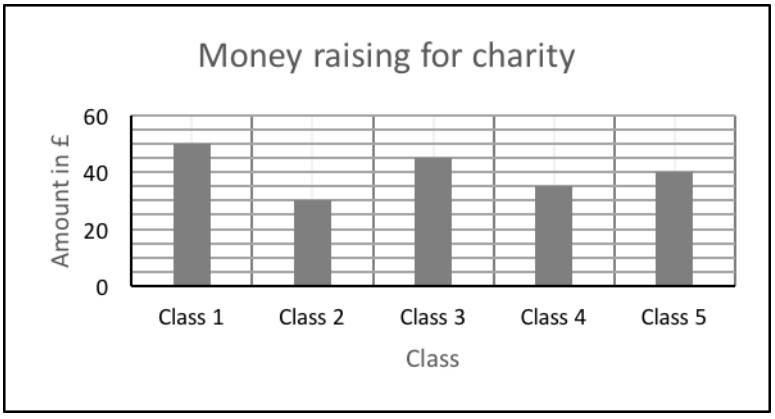
b 25 Accept 23 – 27

c 15 Accept 13 – 17

d 10 Accept 8 – 12

e 2 (girls)

2



Pearl

1 12 noon to 3:00 p.m.

2 **a** 60 (visitors)

b 90 (visitors)

c 30 (visitors)

3 60 (visitors)

4 30 (visitors)

5 180 (visitors)

6 equal to

Diamond

1 Accept any reasonable explanation, e.g.

- There are fewer visitors in the afternoon, so it may be a good idea.
- It depends how much it costs to keep the castle open longer.

2 Accept any reasonable explanation, e.g.

- It's not possible to tell exactly when visitors arrived only the period they arrived in.

3 Yes

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There were 180 visitors for the whole day and 90 arrived between 12 noon to 3:00 p.m.

$\frac{90}{180} = \frac{1}{2}$

4 It is not a fair comparison because it is a longer period of time after 12 noon.

5 Ayesha would be in the bar showing 12 noon to 3:00 p.m. because she arrived between those times.

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Time graphs Pages 62–63

Ruby

1 5 (°C)

2 15 (°C)

3 20 (°C)

4 10 (°C)

5 The temperature stayed the same.

6 20 (cm) Accept 18 (cm) to 22 (cm)

7 80 (cm) Accept 78 (cm) to 82 (cm)

8 3 (weeks) Accept 19 (days) to 23 (days)

9 7 (weeks) Accept 47 (days) to 51 (days)

10 2 (weeks) Accept 12 (days) to 26 (days)

Pearl

1 8:20 a.m. Accept 8:20, 08:20, twenty past eight, 20 past 8

Do not accept 8:20 p.m.

2 500 (m)

3 5 (minutes)

4 100 (m)

5 5 (minutes)

6 200 (m)

7 700 (m)

8 5 (minutes)

9 25 (minutes)

10 15 (minutes)

Diamond

1 The temperature stayed the same.

2 Between Week 5 and Week 6.

The growth slowed down.

3 You cannot tell.

The plant may have continued growing after Week 8 as the graph shows it was continuing to grow up to Week 8.

4 The line is steeper.

A steep line shows that Ari walked a further distance in the same period of time and so was walking faster.

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5 Ari walked 500 metres in 5 minutes at his fastest.

If he walked 700 metres at the same pace it would have taken him 7 minutes.

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Tables

Page 64

Ruby

1 Moto

2 2 (cars)

3 39 (vans)

4 25 (vehicles)

5 7 (cars)

Pearl

1 22 (children)

2 16 (boys)

3 22 (girls)

4 26 (children)

5 48 (children)

Diamond

1 True

The number of men who visited in the afternoon (p.m.) is 30.

60 is double 30.

2 False

The number of children who visited in the morning (a.m.) is 20.

60 is three times 20.

3 False

The total number of visitors is 270.

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