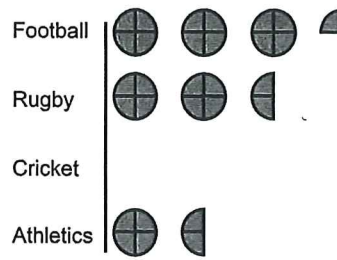


PROGRESS BAR Colour in the progress bar as you get questions correct. Then fill in the progression chart on pages 111–113.

1 The pictogram shows the favourite sports of some Year 7 boys.

- a How many boys like athletics best?
- b How many boys like football best?
- c Seven boys like cricket best.
Draw the symbols on the pictogram to show this.
- d How many boys are there altogether?

Y7 favourite sports



Key: represents 4 boys

2 Helen recorded the number of televisions per household for the students in her class.

~~3, 2, 1, 2, 2, 1, 2, 3, 4, 2, 3, 4, 2, 1, 3~~
2, 2, 3, 1, 2, 3, 2, 2, 1, 3, 4, 2, 3, 2, 1

She crossed off the numbers she recorded in this tally chart.

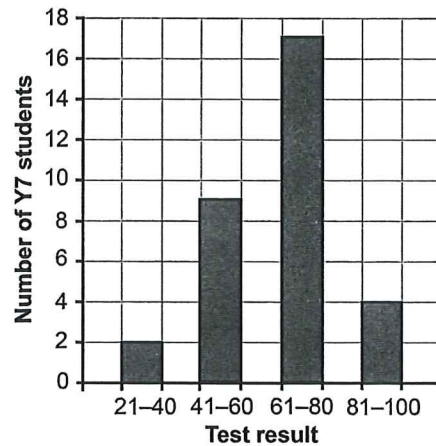
- a Complete the tally chart.
- b Find the mode.
- c Which number of televisions has a frequency of 8?
- d The teacher called out a student's name.
How many televisions is that student's household most likely to have?

TVs	Tally	Frequency
1		
2		
3		
4		

3 Miss Smith recorded the test results for her Year 7 class.

- a How many students scored 41 to 60?
- b Carly scored 57. Which class contains this value?
- c Find the modal class.
- d The pass mark for the test was 61 marks.
How many students passed the test?

Year 7 test results



4 A group of students from two schools were tested on 20 spellings.

- a The students from School A had these results.
15, 12, 9, 17, 14, 12, 16, 19
 - i Work out the range.
 - ii Find the mode.
 - iii Work out the median.
 - iv Calculate the mean.
- b The students from School B had these results.
range = 8, mode = 11, median = 13
 - i Which school had the smaller range?
 - ii Which school achieved the greater modal score?

PROGRESS BAR Colour in the progress bar as you get questions correct. Then fill in the progression chart on pages 111–113.

1 Add the numbers in each set.

a 40, 50, 70 b 6, 8, 1, 2, 4

2 Find the new temperatures.

a The temperature is -4°C . It rises by 9°C

b The temperature is 3°C . It falls by 6°C

3 Write down the next three numbers in this sequence. 28, 22, 16, 10,,,

4 Circle the multiples of 4. 11 12 18 20 22 24

5 Ayesha puts chocolates into boxes. For every white chocolate, she adds 4 milk chocolates. In a box of 30 chocolates

a how many white chocolates are there

b how many milk chocolates are there?

6 Add these numbers together.

a $53 + 45$ b $67 + 28$ c $273 + 649$ d $45 + 38 + 23$

7 Work out

a $76 - 32$ b $82 - 46$ c $264 - 87$ d $741 - 563$

8 Use approximation to estimate these calculations.

a $52 + 68$ b $86 - 23$

9 What do you need to add to 28 to make 100?

10 Write these temperatures in order, coldest first.

-2°C , 4°C , -7°C , 0°C , 2°C , -3°C , -9°C

11 Work out 6^2

12 Work out

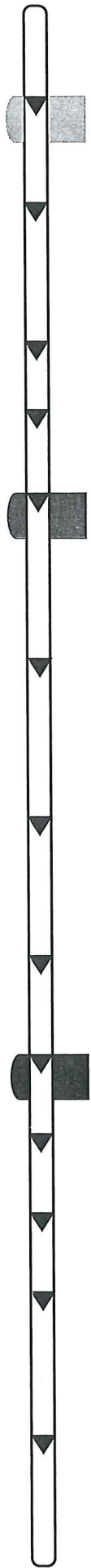
a 57×10 b $690 \div 10$ c 73×100

b 34×1000 e 4500×100 f $18\,000 \div 1000$

13 A café makes a crushed ice drink by mixing 2 litres of juice with 5 litres of water. One day the café sells 35 litres of the crushed ice drink.

a How much juice have they used?

b How much water have they used?



PROGRESS BAR Colour in the progress bar as you get questions correct. Then fill in the progression chart on pages 111–113.

1 Work out the outputs of these function machines.

a Input Output **b** Input Output
 7 → Add 10 → 15 → Subtract 6 →

c Input Output
 3 → × 8 →

2 Write down the function for each machine.

a Input Output **b** Input Output **c** Input Output
 3 → → 18 4 → → 24 15 → → 5
 5 → → 20 7 → → 42 19 → → 9
 7 → → 22 9 → → 54 23 → → 13

3 Simplify

a $j + j + j$ **b** $3k + 5k$ **c** $3q + 4q + q$
d $7f - 4f$ **e** $9h - 7h$ **f** $8d - d - 2d$

4 Here are some algebra cards.

Choose two cards to make each statement correct.

$3d$

$10d$

$9d$

d

$5d$

$7d$

i + = $14d$ **ii** - = $4d$

5 The formula to work out the number of cherry tomatoes needed for a recipe is

number of cherry tomatoes = $6 \times$ number of people
 Work out the number of cherry tomatoes needed for

a 4 people **b** 10 people.

6 Sam earns £ e per month.

a Aisha earns twice as much as Sam.
 Write an expression for the amount Aisha earns per month.

b Ali earns £34 per month less than Sam.
 Write an expression for the amount Ali earns per month.

7 $U = V + X$. Work out the value of U when $V = 25$ and $X = 14$.

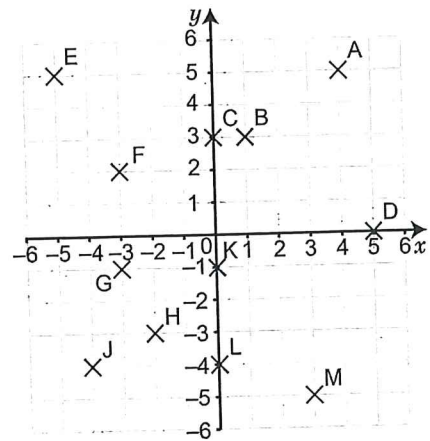
8 $D = ST$. Work out the value of D when $S = 45$ and $T = 2$.

9 Riley is charged 10p for every minute of calls he makes on his phone.
 Write a formula to work out the total cost, c , when you know the number of minutes, m .

PROGRESS BAR Colour in the progress bar as you get questions correct. Then fill in the progression chart on pages 111–113.

1 Write down the coordinates of the points marked with letters.

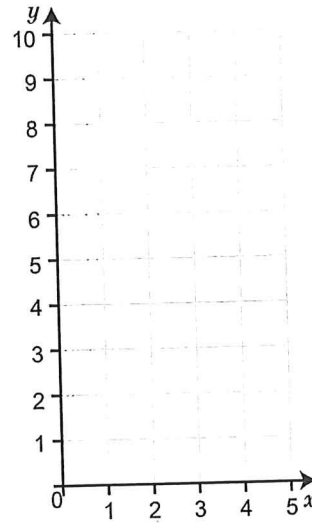
- A(.....,.....) B(.....,.....)
 C(.....,.....) D(.....,.....)
 E(.....,.....) F(.....,.....)
 G(.....,.....) H(.....,.....)
 J(.....,.....) K(.....,.....)
 L(.....,.....) M(.....,.....)



2 a Complete the table of values for the function $y = x + 4$.

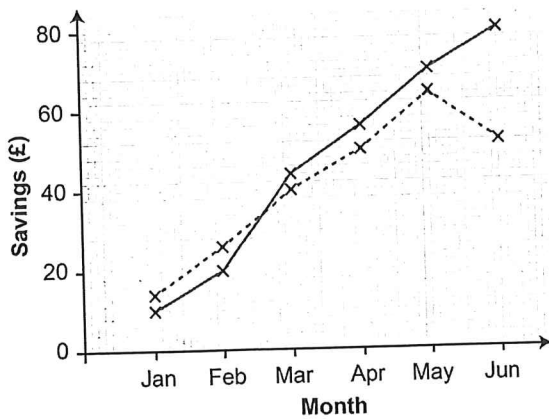
x	0	1	2	3
y				

- b Draw the graph of $y = x + 4$. Label your line $y = x + 4$.
 c Use the graph to find the value of
 i y when $x = 1\frac{1}{2}$
 ii x when $y = 8\frac{1}{2}$



3 The graph shows Josh and Claire's savings.

Josh and Claire's savings



Key
 Josh
 — Claire

- a When does Josh have £64?
 b How much money does Claire have in June?
 c How much does Josh save from January to February?
 d Who has more money in February?
 e Who has more money in June?
 f Who spends some of their savings? Explain how you know.

Multiplication and number rules

- 1 Use the correct priority of operations to work out these calculations. Put brackets round the part that needs to be worked out first.

Multiplication and Division *before* Addition and Subtraction.

Guided

a $4 + 3 \times 2 = 4 + (3 \times 2) = 4 + \dots = \dots$
 b $40 \div 5 + 3 \dots$ c $20 - 21 \div 3 \dots$ d $4 \times 6 - 8 \dots$

- 2 Complete this table for the 12 times table.

x	1	2	5	10	20	50	100
12							

- 3 Use the table from Q2 to work out

Guided

a 30×12		b 155×12		c 161×12		d 205×12	
x	12	x	12	x	12	x	12
10	120	5					
20	240	50					
30		100					
		155					

- 4 Use the grids to work out these multiplications.

a $263 \times 7 =$		b $138 \times 6 =$		c $439 \times 8 =$	
x	7	x	6	x	8
200		100		400	
60		30		30	
3		8		9	
263		138		439	

- 5 Use rounding to estimate the answer to

a $63 \times 8 \dots$ b $4 \times 48 \dots$
 c $77 \times 9 \dots$ d $5 \times 55 \dots$

63 is approximately
 And $\times 8 =$

- 6 Use rounding to estimate the answer to

a $188 \times 3 \dots$ b $5 \times 106 \dots$
 c $167 \times 4 \dots$ d $3 \times 289 \dots$

Round 188 to the nearest 100.

- 7 Use the grids to work out these multiplications.

a $27 \times 32 \dots$

b $16 \times 43 \dots$

Guided

x	20	7
30	30×20 =	30×7 =
2	$\dots \times \dots$ =	$\dots \times \dots$ =

x	10	6
40		
3		

Worked example



Work out the missing answers in the grid and then add them together.

Division

- 8 Write each division answer with a remainder.

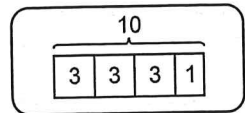
a $10 \div 3 = 3$ remainder 1

b $17 \div 5 = \dots\dots\dots$ remainder $\dots\dots\dots$

Guided

c $40 \div 9 = \dots\dots\dots$ remainder $\dots\dots\dots$

d $18 \div 4 = \dots\dots\dots$ remainder $\dots\dots\dots$



- 9 Work out

a $3 \overline{)9}$ $\dots\dots\dots$

b $4 \overline{)48}$ $\dots\dots\dots$

c $2 \overline{)684}$ $\dots\dots\dots$

d $3 \overline{)936}$ $\dots\dots\dots$

- 10 Work out

a $3 \overline{)27}$ $\dots\dots\dots$

3 doesn't go into 2, so work out how many 3s go into 27.

b $5 \overline{)435}$ $\dots\dots\dots$

c $4 \overline{)592}$ $\dots\dots\dots$

d $6 \overline{)534}$ $\dots\dots\dots$

e $676 \div 4 \dots\dots\dots$

- 11 Work out

Guided

a $4 \overline{)513}$ $\dots\dots\dots$

How many 4s go into 5?
What's the remainder?

$1 \square r \square$
 $4 \overline{)513}$

b $3 \overline{)253}$ $\dots\dots\dots$

c $5 \overline{)432}$ $\dots\dots\dots$

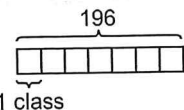
d $6 \overline{)215}$ $\dots\dots\dots$

e $532 \div 9 \dots\dots\dots$

Solving problems

- 12 **Problem-solving** A school has 196 students and 7 equal size classes. How many are in each class?

Draw a bar model.



- 13 **Problem-solving** A camping trip to France costs £283 per person. What is the total cost for 4 people?

- 14 **Reasoning** Sophie answers the question, 'How many 10-seater minibuses do you need for 34 people?', like this:

Guided

$34 \div 10 = 3$ remainder 4

So you need 3 minibuses.

Is she right? Explain your answer.

Will all 34 people fit in 3 minibuses?

- 15 **Problem-solving** How many 5 ml doses of medicine are in a 275 ml bottle?

Multiples, factors and primes

- 16 Complete these labels. The first one has been started for you.

a $3 \times 5 = 15$

b $2 \times 6 = 12$

Guided

factor of 15 of 15	multiple of 3 of 5
-----------------	----------------	-----------------------------

..... of 12 of 12 of 2 of 6
----------------	----------------	--------------------------

- 17 Write down
 a two factors of 10 b two factors of 16 c two multiples of 6

- 18 Find the factors of

- a 9
 $1 \times \dots = 9$
 $3 \times \dots = 9$
 Factors of 9 are 1, 3,
- b 30
- c 24
- d 50

Write a multiplication first.
 $\square \times \square = 10$

- 19 a Circle the numbers with 2 as a factor. 6 18 23 31 207 348
 b Circle the numbers with 10 as a factor. 10 15 30 460 575 940
 c Circle the numbers with 5 as a factor. 6 15 20 30 205 345

- 20 Complete this sentence about prime numbers, using the correct number in each space.
 'A prime number has only factors: and itself.'

- 21 Use these sets of multiples to help you.

First 10 multiples of 4

8	16	28	32	36
20	4	12	24	40

First 10 multiples of 5

45	40	35	5	50
25	30	10	20	15

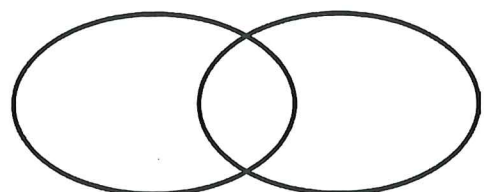
First 10 multiples of 6

54	42	18	12	6
36	24	30	60	48

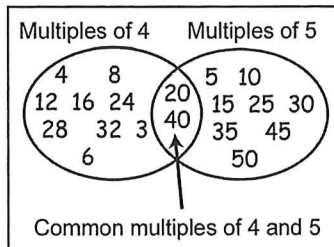
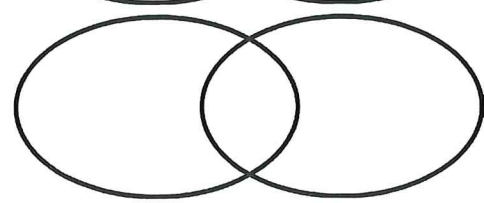
This Venn diagram shows the common multiples of 4 and 5.
 Complete the Venn diagrams to show the common multiples of

Guided

- a 4 and 6



- b 5 and 6



- 22 Circle the prime numbers.
 3 7 9 11 13 15 23

Does the number have any factors except 1 and itself?

PROGRESS BAR Colour in the progress bar as you get questions correct. Then fill in the progression chart on pages 111–113.

1 Circle the multiples of 3.

15 20 39 63 73 200 201

2 Work out

a $485 \div 5$ b 368×4 c $432 \div 6$ d 251×8

3 a Divide 35 by

i 3 ii 4 iii 9

b Which has the largest remainder?

4 Work out

a $4 + 3 \times 6 - 5$ b $30 \div 6 \times 5$ c $40 \div 8 - 5 + 9$

5 Write down all the factors of

a 14 b 18 c 30

6 What is the highest common factor of 24 and 30?

7 What is the lowest common multiple of 5 and 8?

8 Circle the prime numbers.

31 33 35 37 39

9 Write whether each statement is true or false.

a 64 is a square number.

b 251 is a multiple of 9.

c 8 is a factor of 32.

d 32 is a factor of 8.

e 41 is a prime number.

10 Charm bracelets are made using 8 charms.
How many bracelets can be made with 270 charms?

Decimal numbers

- 1 Write each number into the place-value table. What is the value of the 3 in each number?

a 6.38

U	.	t	h
6	.	3	8

b 3.09

U	.	t	h
	.		

c 5.73

U	.	t	h
	.		

Is the 3 in the units (U), tenths (t) or hundredths (h) column?

- 2 Circle the numbers which have the same value.

4.01 4.1 4.10 44.10 4.100

Write them in a place-value table.

U	.	t	h	th

- 3 Compare these pairs of numbers. Write < or > between each pair.

a 7.46 7.64

U	.	t	h
7	.	4	6
7	.	6	4

b 3.41 3.08

U	.	t	h
	.		

c 2.4 2.05

U	.	t	h
	.		

Write both numbers in the place-value tables. Work from left to right.

They both have 7 units, but 7.64 has more tenths.



- 4 Write these decimals in order, smallest first.

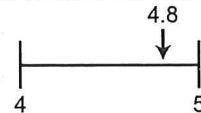
6.23 6.33 6.32 6.22

Compare the digits, starting with the units.

- 5 Round these numbers to the nearest whole number.

a 4.8 b 7.3 c 6.5

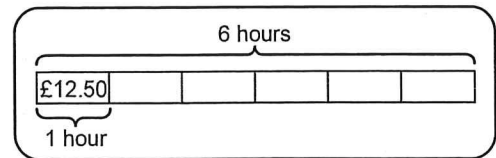
Use a number line. Which whole number is it closer to?



- 6 Round these numbers to 1 decimal place.

a 1.36 b 6.54 c 8.25

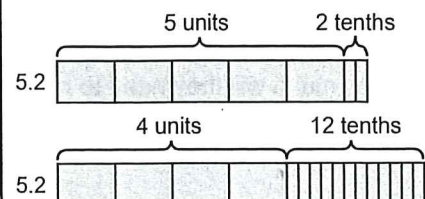
- 7 **Real / Finance** Rayan earns £12.50 an hour. How much does he earn for a 6-hour shift?



- 8 Work out

a $1.3 + 2.5$
 b $4.6 + 3.8$
 c $2.7 + 6.9$

Split one of the units in 5.2 into 10 tenths



- 9 Work out



a $7.6 - 4.3$
 b $5.2 - 1.8$
 c $7.4 - 2.5$

10 a Work out i 6×9 ii 6×0.9

b What do you notice?

c $8 \times 6 = 48$. What is 8×0.6 ?

d $7 \times 12 = 84$. What is 0.7×12 ?

11 a Work out i $63 \div 9$ ii $6.3 \div 9$

b What do you notice?

c $32 \div 4 = 8$. What is $3.2 \div 4$?

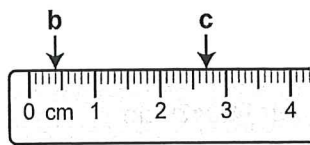
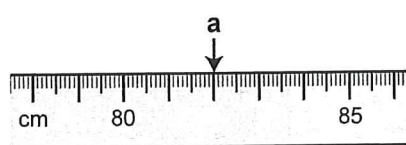
d $42 \div 6 = 7$. What is $4.2 \div 7$?

Measurements and scales



What measurement do the small marks represent?

12 Write these measurements. Write the number and the units.

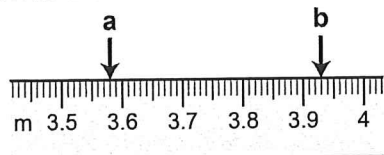


a

b

c

13 Write these measurements to 2 decimal places.



a

b

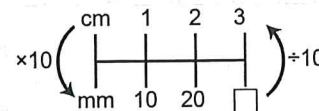
14 Use a double number line to convert between centimetres and millimetres.

a $3 \text{ cm} = \dots \times 10 = \dots \text{ mm}$

b $7.5 \text{ cm} = \dots \text{ mm}$

c $60 \text{ mm} = \dots \div 10 = \dots \text{ cm}$

d $23 \text{ mm} = \dots \text{ cm}$



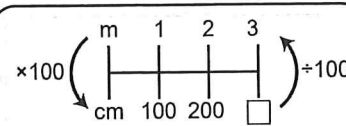
15 Use a double number line to convert between centimetres and metres.

a $5 \text{ m} = \dots \times 100 = \dots \text{ cm}$

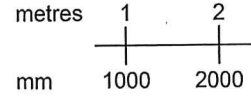
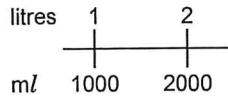
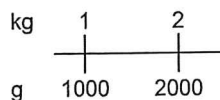
b $4.28 \text{ m} = \dots \text{ cm}$

c $700 \text{ cm} = \dots \div 100 = \dots \text{ m}$

d $430 \text{ cm} = \dots \text{ m}$



16 Use the double number lines to work out these conversions.



a $4 \text{ m} = \dots \text{ mm}$

b $6 \text{ kg} = \dots \text{ g}$

c $5.6 \text{ litres} = \dots \text{ ml}$

d $8000 \text{ ml} = \dots \text{ litres}$

e $2500 \text{ g} = \dots \text{ kg}$

f $9800 \text{ mm} = \dots \text{ m}$

17 Compare these measurements. Write $<$ or $>$ between each pair.

a $250 \text{ cm} \dots 3 \text{ m}$

$3 \text{ m} = 3 \times 100 = 300 \text{ cm}$

Convert to the same units.
Now compare 250 cm and 300 cm. $250 < 300$

Convert the measurements
to the same units.

b $7.2 \text{ litres} \dots 7100 \text{ ml}$

c $8 \text{ cm} \dots 77 \text{ mm}$

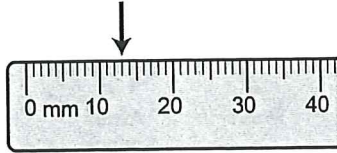
d $8300 \text{ g} \dots 8.5 \text{ kg}$

18 Write these measurements in order, smallest first.

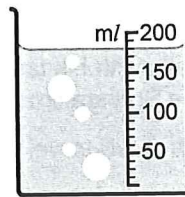
66 cm 6 m 6 cm 6.6 m

PROGRESS BAR Colour in the progress bar as you get questions correct. Then fill in the progression chart on pages 111–113.

1 Write down these measurements.

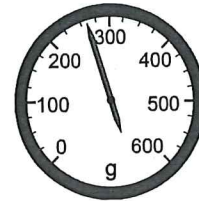


a



b

2 Estimate the mass shown on this scale.



3 Measure this line. _____

4 What is the value of the 2 in each of these numbers?

a 46.27 b 29.01

c 90.12 d 62.53

5 What is the change from £10 for each amount?

a £6.25 b £1.95 c £8.65

6 Write these in order, smallest first. 3.5 5.3 3.15 3.41 3.1

7 Work out

a $3.4 + 7.8$ b $7.3 - 2.8$ c $35.6 + 84.9$ d $145.2 - 68.7$

8 How much shorter is 34.7 m than 82.5 m?

9 Convert these units.

a $4.7 \text{ kg} = \dots\dots\dots \text{ g}$ b $5870 \text{ m} = \dots\dots\dots \text{ km}$ c $45 \text{ mm} = \dots\dots\dots \text{ cm}$

10 Write these measures in order, smallest first. 5.68 litres 5500 ml 5.55 litres

11 Round each number to the nearest whole number.

a 6.3 b 4.65 c 7.5

12 Round each number to the nearest 1 decimal place.

a 5.34 b 3.67 c 7.85



13 A pack of 24 felt-tip pens costs £4.99. How much does one felt-tip pen cost, to the nearest penny?

KS3 Maths Progress Pi 1

1 Unit test

1 a 6 boys

b 13 boys



d 36 boys

2 a 6, 13, 8, 3

b 2 televisions

c 3 televisions

d 2 televisions

3 a 9 students

b 41–60

c 61–80

d 21 students

4 a i 10

ii 12

iii 14.5

b i School B

ii School A

2 Unit test

1 a 160

b 21

2 a 5°C

b -3°C

3 4, -2, -8

4 12, 20, 24

5 a 6 chocolates

b 24 chocolates

6 a 98

b 95

c 922

d 106

7 a 44

b 36

c 177

d 178

8 a 120

b 70

9 72

10 -9°C, -7°C, -3°C, -2°C, 0°C, 2°C, 4°C

11 36

12 a 570

b 69

c 7300

d 34 000

e 450 000

f 18

13 a 10 litres

b 25 litres

3 Unit test

1 a 17

b 9

c 24

2 a + 15

b $\times 6$

c - 10

3 a $3j$

b $8k$

c $8q$

d $3f$

e $2h$

f $5d$

4 i $9d + 5d$

ii $7d - 3d$, $9d - 5d$, or $5d - d$

5 a 24 cherry tomatoes

b 60 cherry tomatoes

6 a $\text{£}2e$

b $\text{£}(e - 34)$

7 39

8 90

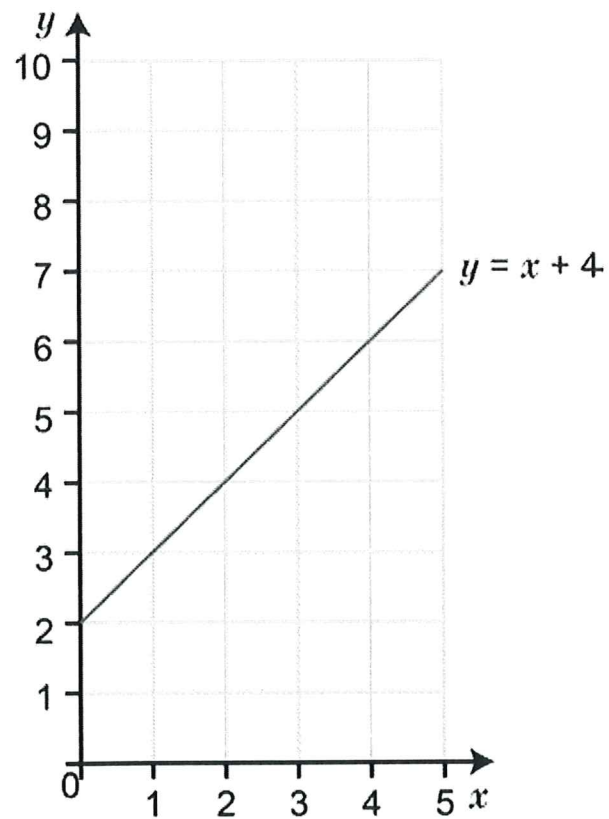
9 $c = 10m$ (in pence)

4 Unit test

1 A(4, 5), B(1, 3), C(0, 3), D(5, 0), E(-5, 5), F(-3, 2), G(-3, -1), H(-2, -3), J(-4, -4) K(0, -1), L(0, -4), M(3, -5)

2 a 4, 5, 6, 7

b



c i 512

ii 412

3 a May

b £80

c £12

d Josh

e Claire

f Josh, because the dotted line on the graph slopes downwards from May to June.

5 Strengthen

Multiplication and number rules

1 a 10

b 11

c 13

d 16

2 12, 24, 60, 120, 240, 600, 1200

3 a 360

b 1860

c 1932

d 2460

4 a 1841

b 828

c 3512

5 a 480

b 200

c 720

d 300

6 a 600

b 500

c 800

d 900

7 a 864

b 688

Division

8 b 3 r 2

c 4 r 4

d 4 r 2

9 a 3

b 12

c 342

d 312

10 a 9

b 87

c 148

d 89

e 169

11 a 13 r 1

b 84 r 1

c 86 r 2

d 35 r 5

e 59 r 1

Solving problems

12 28 students

13 £1132

14 No, because you need a minibus for the 4 people left over. You need 4 minibuses altogether.

15 55 doses

Multiples, factors and primes

16 a factor, multiple

b factor, factor, multiple, multiple

17 a Any two of 1, 2, 5 and 10

b Any two of 1, 2, 4, 8 and 16

c Any two of 6, 12, 18, ...

18 a 1, 3, 9

b 1, 2, 3, 5, 6, 10, 15, 30

c 1, 2, 3, 4, 6, 8, 12, 24

d 1, 2, 5, 10, 25, 50

19 a 6, 18, 348

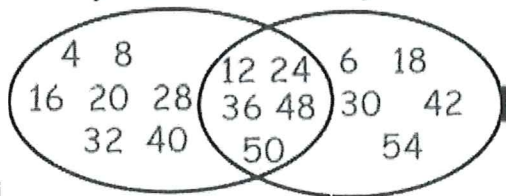
b 10, 30, 460, 940

c 15, 20, 30, 205, 345

20 2, 1

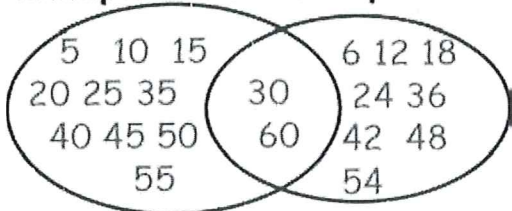
21 a i

Multiples of 4 Multiples of 6



ii

Multiples of 5 Multiples of 6



22 3, 7, 11, 13, 23

5 Unit test

1 15, 39, 63, 201

2 a 97

b 1472

c 72

d 2008

3 a i 11 r 2

ii 8 r 3

iii 3 r 8

b 9

4 a 17

b 25

c 9

5 a 1, 2, 7, 14

b 1, 2, 3, 6, 9, 18

c 1, 2, 3, 5, 6, 10, 15, 30

6 6

7 40

8 31, 37

9 a true

b false

c true

d false

e true

10 33 bracelets

6 Strengthen

Decimal numbers

1 a 3 tenths

b 3 units

c 3 hundredths

2 4.1, 4.10, 4.100

3 a <

b >

c >

4 6.22, 6.23, 6.32, 6.33

5 a 5

b 7

c 7

6 a 1.4

b 6.5

c 8.3

7 £75

8 a 3.8

b 8.4

c 9.6

9 a 3.3

b 3.4

c 4.9

10 a i 54

ii 5.4

b The answer to 6×0.9 is the same as the answer to 6×9 , divided by 10.

c 4.8

d 8.4

11 a i 7

ii 0.7

b The answer to $6.3 \div 9$ is the same as the answer to $63 \div 9$, divided by 10.

c 0.8

d 0.6

Measurements and scales

12 a 82 cm

b 4 mm or 0.4 cm

c 27 mm or 2.7 cm

13 a 3.58 m

b 3.93 m

14 a 30 mm

b 75 mm

c 6 cm

d 2.3 cm

15 a 500 cm

b 428 cm

c 7 m

d 4.3 m

16 a 4000 mm

b 6000 g

c 5600 ml

d 8 litres

e 2.5 kg

f 9.8 m

17 a <

b >

c >

d <

18 6 cm, 66 cm, 6 m, 6.6 m

6 Unit test

1 a 13 mm

b 180 ml

2 260 g

3 3.3 cm

4 a 2 tenths

b 2 tens

c 2 hundredths

d 2 units

5 a £3.75

b £8.05

c £1.35

6 3.1, 3.15, 3.41, 3.5, 5.3

7 a 11.2

b 4.5

c 120.5

d 76.5

8 47.8 m

9 a 4700 g

b 5.87 km

c 4.5 cm

10 5500 ml, 5.55 litres, 5.68 litres

11 a 6

b 5

c 8

12 a 5.3

b 3.7

c 7.9

13 21p