Spring Progress Check Revision Material

Year 7 Set 1 - 3

Delta

Test Date: Thursday 18 Jan

How to revise for Maths?

- *Practise is key! Attached you will find some questions to help you do that.*
- *Once you've answered the questions – mark your work.*
- *If you get something wrong, look back on what you did and try work out where your mistake is. Unsure? Take your answers to your teacher or to Maths club on a Thursday and get help ahead of the test!*
- *Good luck!*

PROGRESS BAR Colour in the progress bar as you get questions correct. Then fill in the progression chart on pages 107-109.

1 The table shows the numbers of items hand-painted by Fin and Paj on Monday.

	Cups	Mugs	Teapots
Fin	20	40	10
Paj	50	10	20

a How many items did Fin paint on Monday? ....

b How many mugs were painted altogether? ....

c How many items were painted altogether? ....

d The compound bar chart shows the numbers of items hand-painted by Fin and Paj on Friday. How many mugs were painted on both days altogether?

Number of items painted
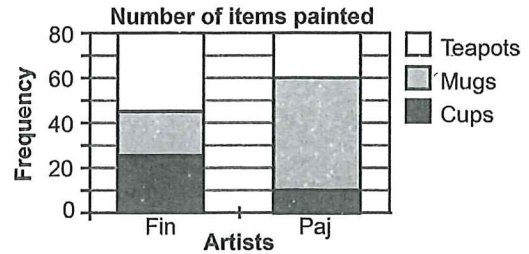
2 Betty recorded the number of 'bullseyes' she hit at archery practice each week.

7, 7, 4, 10, 6, 10, 39, 13, 9, 7

Which average should she use to describe the data? Explain your answer.

3 The table shows the distances travelled by a lorry driver.

Distance (miles)	152	201	350	279	501	388	412	230	137	255

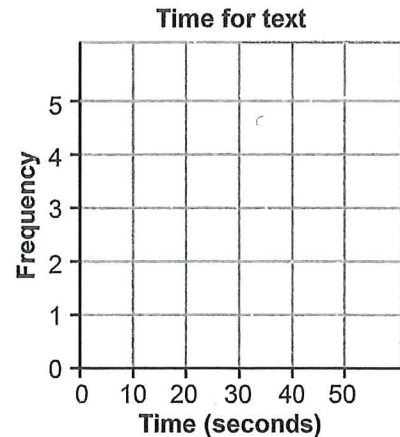Work out the mean distance travelled.

4 Here are the times taken, in seconds, for 15 students to send a text.

13, 22, 23, 9, 46, 30, 18, 5, 13, 29, 13, 9, 32, 26, 25

a Complete the tally chart for the data.

b What is the modal class?

| Time, t (s)	Tally	Frequency
$0 \le t < 10$		
$10 \le t < 20$		
$20 \le t < 30$		
$30 \le t < 40$		
$40 \le t < 50$		

Time for text

c Complete the frequency diagram for the data.

5 The table shows the pulse and breathing rates (per minute) of ten people during different activities.

Pulses per minute	62	68	72	75	85	84	90	88	96
Breaths per minute	17	19	21	21	25	27	29	29	31

a Draw a scatter graph for the data using these axes.

b Describe the correlation between breathing rate and pulse rate. ....

c Draw a line of best fit.

d Val has a pulse rate of 80 per minute. Estimate her breathing rate. ....
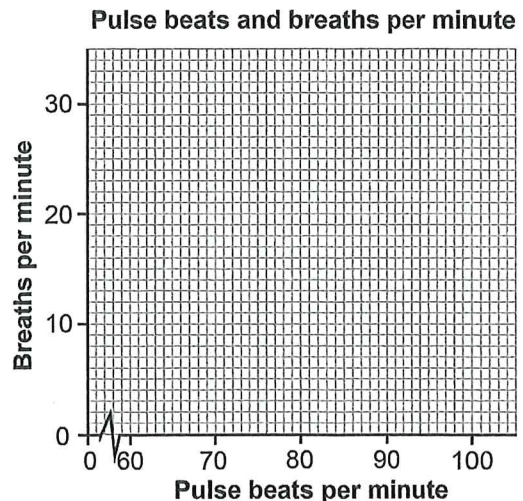
Pulse beats and breaths per minute

PROGRESS BAR Colour in the progress bar as you get questions correct. Then fill in the progression chart on pages 107-109.

1 a What is the highest common factor of 16 and 18? _____

   b Is your answer to part **a** a prime number? _____

2 a What is the lowest common multiple of 3 and 7? _____

   b Is your answer to part **a** a prime number? _____

3 Work out

   a $868 \div 14$ _____   **b** $911 \div 22$ _____   **c** $5 \div 6$ _____

4 Work out

   a $12 + {-6}$ _____   **b** $-5 - 6$ _____   **c** $8 - {-7}$ _____

5 Work out an estimate for $\sqrt{18}$. _____

6 Write down both answers to $\sqrt{49}$. _____

7 Work out

   a 2×4^3 _____   **b** $\dfrac{2^3}{2^2}$ _____   **c** $8 \times \sqrt[3]{27} + 6$ _____

8 Work out

   a $15 \times {-2}$ _____   **b** -8×-8 _____

   c $5 \times (-3)^2$ _____   **d** $(-5)^3 \times -2$ _____

9 Estimate the answer to each calculation.

   a $29 \times 12 + 48 \times 23$ _____

   b $32.7 + \dfrac{16.1}{5.2}$ _____

10 Use the fact that

   a $324 = 9 \times 36$ to work out $\sqrt{324}$. _____

   b $-1728 = -27 \times 64$ to work out $\sqrt[3]{-1728}$. _____

11 Work out

   a $\dfrac{3^3 - 3^2}{6}$ _____   **b** $\dfrac{62 + \sqrt[3]{1000}}{6^2}$ _____

1 To convert between days and hours use the formula

Hours = number of days × 24

Work out the number of hours in 5 days. ....

2 The formula for calculating the perimeter of a shape, P, is $P = 2x + 5y$. Work out the value of P when $x = 12$ and $y = 3$.

3 Use the formula $T = \dfrac{h(h-1)}{3}$ to work out the value of T when $h = 6$.

4 Expand $5(p - 3)$. ....

5 Write an expression for

   a 5 less than t ....   **b** 4 times w ....   **c** p divided by 3. ....

6 Sophia jogs or swims every day. When she jogs she covers 1 mile. When she swims she covers 3 miles. Write a formula connecting the total distance she travels, T, with the number of days she jogs, j, and the number of days she swims, s.

7 Work out the value of these expressions when $x = 2$ and $y = 5$.

   a $3(x + 4)$ ....   **b** $2(5x + y)$ ....

8 By collecting like terms, simplify $4 + 3e - 1 + 2e$. ....

9 Simplify

   a $t \times t \times t \times t$ ....   **b** $2p \times p$ ....   **c** $2y \times 3y$ ....

10 By collecting like terms, simplify $2v^3 + 3v^2 + 4v^3$. ....

11 Expand $5d(3d + 3)$. ....

12 What is the value of x^2 when $x = 8$?

13 Find the value of each expression when $p = 3$ and $q = 7$.

   a p^3 ....   **b** $q^2 - p$ ....

   c $(q - p)^2$ ....   **d** $\dfrac{3p+q}{4}$ ....

14 Factorise

   a $3d - 12$ ....   **b** $12e + 16$ ....   **c** $15 - 10f$ ....

PROGRESS BAR Colour in the progress bar as you get questions correct. Then fill in the progression chart on pages 107-109.

1 Write each fraction in its simplest form.

   a $\frac{10}{15}$ ------------------

   b $\frac{9}{36}$ ------------------

   c $\frac{24}{30}$ ------------------

2 Write these amounts in order of size, starting with the smallest.

   $\frac{5}{6}$ of £30 $\frac{1}{3}$ of £69 $\frac{2}{5}$ of £60 --

3 Work out these. Give each answer in its simplest form.

   a $\frac{1}{2} + \frac{1}{6}$ ------------------

   b $\frac{11}{15} - \frac{1}{3}$ ------------------

4 Write $\frac{32}{5}$ as a mixed number. ------------------

5 Write $5\frac{3}{7}$ as an improper fraction. ------------------

6 Work out $18 \times \frac{5}{6}$

7 Complete this table.

Fraction		$\frac{3}{4}$		$1\frac{3}{10}$	
Decimal	0.1				5.5
Percentage			60%		

8 Work out these. Write each answer in its simplest form.

   a $3\frac{3}{4} + 2\frac{7}{12}$

   b $2\frac{8}{9} - 2\frac{1}{2}$

9 Work out $32 \div \frac{4}{5}$

10 Write 4 hours 15 minutes as a mixed number of hours. --

11 Work out $2\frac{5}{12} + 5\frac{1}{8} - 4\frac{3}{4}$. Write your answer in its simplest form.
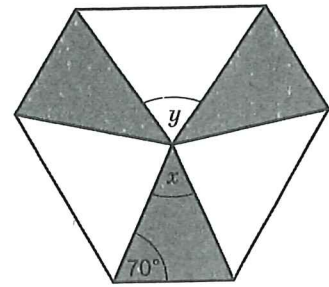
12 Work out $\frac{4}{15} \times \frac{5}{16}$
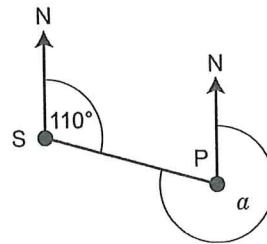
13 Work out $4 \times 3\frac{3}{5}$

14 Work out $8\frac{1}{2} \div \frac{7}{8}$

1 Problem-solving This pattern is made up of three identical grey isosceles triangular tiles and three identical white isosceles triangular tiles.

  a Work out angle x. ....
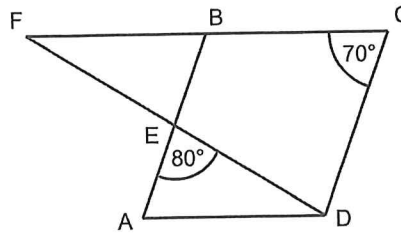
  b Work out angle y. Show your working.

2 Real The diagram shows a ship S and a port P on a map. The arrows both point to north. They are parallel. Work out the angle marked a.

Extend the line SP.

3 Reasoning Work out all of the other angles.
ABCD is a rhombus.
DEF is a straight line.
Angle BCD = 70°
Angle AED = 80°
Give reasons for your answers.

You can describe a shape using the letters at its **vertices** (the plural of **vertex**).
This angle is called angle ABC or ∠ABC.

Mark any parallel lines. Write in each angle as you work it out. Describe the angles using 3 letters.
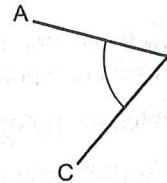
4 Reasoning Show that the sum of the interior angles of an icosagon (20-sided shape) is 3240°.
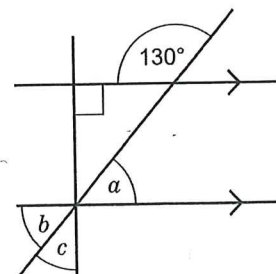
'Show that' means work out the answer and show it is the same as the one given.

5 Work out the angle marked a.
Give reasons.
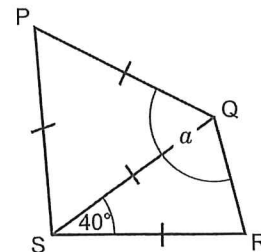
6 Work out the angles marked with letters.
Give reasons for your working.

7 In the diagram, angles x and y are called co-interior angles.
Complete this proof that co-interior angles sum to 180°.

$x =$ .... (....................... angles)

$y =$ .... $-$ .... ° (angles on a straight line)

$x + y =$ .... $+$ .... $=$ .... °

> You must prove that
> $x + y = 180°$.
> Find the expressions
> for x and y and then
> add them together.

8 Work out the angles p, q and r.

a

p

130°

b

q 70°

c

r

125°

> Look at Q7.

....

9 Reasoning   Here are three regular polygons.
Work out the angles marked with letters.
Give a reason for each answer.

> Use line symmetry
> in your calculations.

a

a
b

b

c
d
e

c

f
g
h

a ....

....

b ....

....

c ....

....

d ....

e ....

....

f ....

....

g ....

....

h ....

....

10 A chiliagon is a polygon with 1000 sides. For a regular chiliagon, work out

a the exterior angle

b the interior angle.

11 Work out the angle, x, at the centre of each regular polygon.

> Angle at the centre of an
> n-sided regular polygon $= \dfrac{360°}{n}$

a

x

b

x

c

x

$x = \dfrac{360°}{5} =$ .... °

$x = \dfrac{360°}{.....} =$ .... °

....

x

12 Reasoning   The diagram shows
a polygon in the shape of a star.
Angle x is 30°. Work out angle y.

x y y x

y y

y

x x

> Work out the
> sum of the
> interior angles.

Ordering and rounding decimals

☐ **1** Write these numbers in order from smallest to largest.

     a 8.3, 9.5, 9.2, 8.4 ....

     b 0.55, 0.006, 0.606, 0.055, 0.06 ....

> Use the number line to help you.
>
> 0.752
>
> 0.74   0.75   0.76   0.77
>
> Is 0.752 closer to 0.75 or 0.76?

☐ **2** Round each number to 2 decimal places.

     a 0.752 ....   **b** 0.768 ....

     c 0.7455 ....   **d** 0.7549 ....

☐ **3** Work out, to the nearest penny, £4.30 ÷ 3 ....

> £☐.☐☐

Add and subtract decimals

☐ **4** Work out these. Use an estimate to check your answers.

> Guided

     a 27 − 2.3 = 24. ....

     b 100 − 15.1 ....

> First subtract the whole number. Then subtract the decimal.
>
> 24   25   27

☐ **5** Work out these. Use an estimate to check your answers.

> Guided

     a 6.7 + 1.43   **b** 8.55 + 4.6

        6. 7 0 — Write a zero to make the calculation easier.
     + 1. 4 3
     ───────

> When using the column method, always line up the decimal points.

> Write a zero to make the calculation easier.

☐ **6** Work out these. Use an estimate to check your answers.

     a 3.7 − 0.22   **b** 25.5 − 2.42   **c** 7.3 − 0.898

> **Worked example**
>
> [QR code]

Multiply and divide decimals

☐ **7** Work out these multiplications. Use an estimate to check your answers.

> Guided

     a 2.6 × 2

     26 × 2 = 52, so 2.6 × 2 = ...

     b 21.5 × 3   **c** 10.13 × 4

> Use a number pattern.

☐ **8** Use a mental method and the multiplication facts you know to work out

     a 8 × 0.3 ....   **b** 70 × 0.2 ....

     c 0.04 × 6 ....   **d** 30 × 0.06 ....

> Use a number pattern.
> 8 × 3 = 24, 8 × 0.3 = ☐

9 Work out

Guided

  a 0.5 × 0.5

  5 × 5 = 25, 5 × 0.5 = 2.5, 0.5 × 0.5 = ...

  b 0.04 × 0.7 ....   **c** 0.08 × 0.05...........................

10 Work out

  a 5.2 × 0.41

  b 0.32 × 2.12

Use a pattern to work out 5.2 × 0.41

$$\begin{array}{r} 52 \\ \times\ 41 \\ \hline \end{array}$$

11 Work out

  a 42.3 ÷ 3

  b 36.15 ÷ 5

$3\overline{)423}$

423 ÷ 3 = ☐

42.3 ÷ 3 = ☐

12 Work out

  a 8 ÷ 0.2

  b 27 ÷ 0.9

Use a number pattern.
  a 8 ÷ 2, 8 ÷ 0.2
  d 6 ÷ 3, 0.6 ÷ 3, 0.6 ÷ 0.3, 0.6 ÷ 0.03

  c 42 ÷ 0.06

  d 0.6 ÷ 0.03

Fractions, decimals and percentages

13 Complete these number lines showing percentages, decimals and fractions.
Write each fraction in its simplest form.
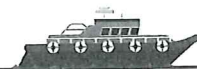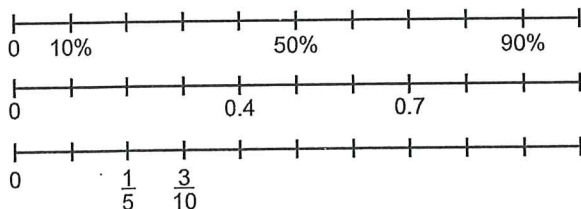
First complete the percentages number line, then the decimals, then the fractions. Write the fractions as tenths and simplify.

```
├──┼──┼──┼──┼──┼──┼──┼──┼──┤
0   10%        50%        90%
```

```
├──┼──┼──┼──┼──┼──┼──┼──┼──┤
0            0.4       0.7
```

```
├──┼──┼──┼──┼──┼──┼──┼──┼──┤
0         1/5  3/10
```

14 Which card does not have an equivalent card?

| 1.33 | 140% | $\frac{2}{3}$ | $0.\dot{6}$ | $\frac{4}{3}$ | 1.25 | 133.33...% | 1.4 | $\frac{5}{4}$ |

15 Work out

Guided

  a 1% of 40 = 40 ÷ 100 = 0.4

  b 11% of 40 = 0.4 × 11 = ...

  c 1% of £140 ....

  d 29% of £140 ....

$1\% = \frac{1}{100}$

1% of 40 = ...

×11

11% of 40 = ...

×11
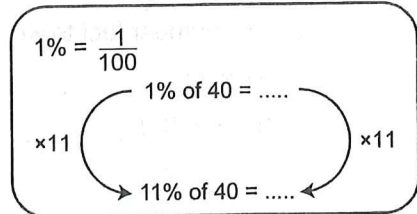
16 a Increase £50 by 40%.

  b Decrease 80 m*l* by 35%.

£50

40%

.....
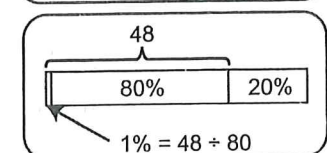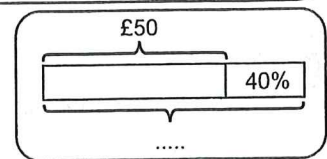
17 80% of an amount is 48.
Work out the original amount.

48
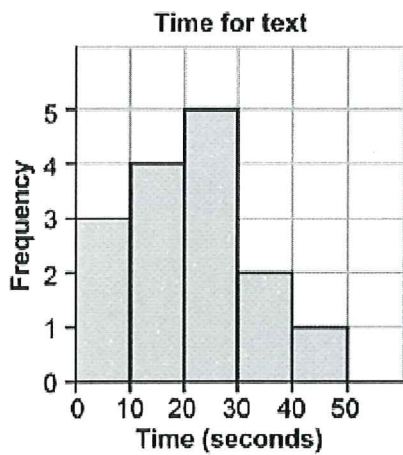
| 80% | 20% |

1% = 48 ÷ 80

61

1 Unit test

1 a 70 items

  b 50 mugs

  c 150 items

  d 310 mugs

2 a The median; e.g. the mode is low compared to her general scores and the mean is skewed by the extreme value of 39.
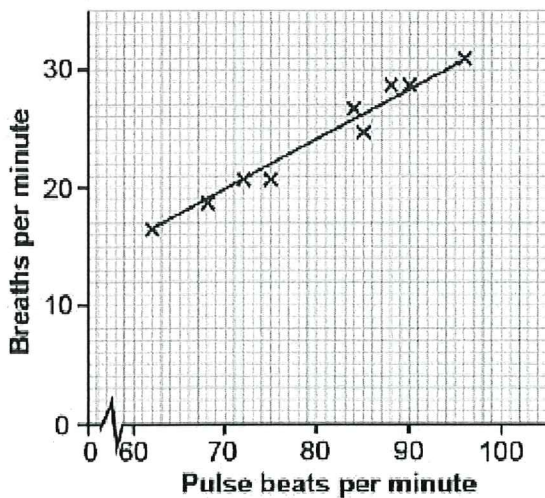
3 290.5

4 a

Time, t (s)	Tally	Frequency
$0 \leq t < 10$	III	3
$10 \leq t < 20$	IIII	4
$20 \leq t < 30$	HH	5
$30 \leq t < 40$	II	2
$40 \leq t < 50$	I	1

  b $20 \text{ s} \leq t < 30 \text{ s}$

c

Time for text

5 a

Pulse beats and breaths per minute

  b There is a positive correlation between breathing rate and pulse rate.

  c about 24 breaths per minute

2 Unit test

1 a 2
  b Yes
2 a 21
  b No
3 a 62

b 41 r 9
c 0.833
4 a 6
  b −11
  c 15
5 e.g. 4.2
6 7, −7

7 a 128
  b 2
  c 30
8 a −30
  b 64
  c 45
  d −250

9 a about 1300
  b about 36
10 a 18
  b −12
11 a 3
  b 2

3 Unit test

1 120 hours
2 39
3 10
4 $5p - 15$
5 a $t - 5$
  b $4w$
  c $\frac{p}{3}$
6 $T = j + 3s$

7 a 18
  b 30
8 $5e + 3$
9 a t^4
  b $2p^2$
  c $6y^2$
10 $6v^3 + 3v^2$
11 $15d^2 + 15d$

12 64
13 a 27
  b 46
  c 16
  d 4
14 a $3(d - 4)$
  b $4(3e + 4)$
  c $5(3 - 2f)$

4 Unit test

1 a $\frac{2}{3}$
  b $\frac{1}{4}$
  c $\frac{4}{5}$
2 $\frac{1}{3}$ of £69, $\frac{2}{5}$ of £60, $\frac{5}{6}$ of £30
3 a $\frac{2}{3}$
  b $\frac{2}{5}$
4 $6\frac{2}{5}$
5 $\frac{38}{7}$
6 15

7

Fraction	$\frac{1}{10}$	$\frac{3}{4}$	$\frac{3}{5}$	$1\frac{3}{10}$	$5\frac{1}{2}$
Decimal	0.1	0.75	0.6	1.3	5.5
Percentage	10%	75%	60%	130%	550%

9 40
10 $4\frac{1}{4}$
11 $2\frac{19}{24}$
12 $\frac{1}{12}$
13 $14\frac{2}{5}$
14 $9\frac{5}{7}$

5 Extend

1 a 40°

 b 80°

2 290°

3

Angle	Value	Reason
AED	80°	Given
BCD	70°	Given
EAD	70°	Opposite angles in a rhombus are equal
ADE	30°	Angles in a triangle sum to 180°
EBC	110°	Adjacent angles in a rhombus sum to 180°
CDE	90°	Opposite angles in a rhombus are equal, and ADE = 30°
BED	100°	Angles on a straight line sum to 180°
BEF	80°	Angles on a straight line sum to 180°
EBF	70°	Angles on a straight line sum to 180°
EFB	30°	Angles in a triangle sum to 180°

4 $18 \times 180 = 3240$

5 130°

6 $a = 50°$ (angles on a straight line sum to 180°, then corresponding angles)

 $b = 50°$ (vertically opposite angles are equal)

 $c = 40°$ (angles in a right angle sum to 90°)

7 a, corresponding; 180, a; a, $180 - a$, 180°

8 a 50°

 b 110°

 c 55°

9 a $a = 120°$ (interior angles of hexagon sum to 720°)

 $b = 60°$ (angle is bisected)

 b $c = 135°$ (interior angles of an octagon sum to 1080°)

 $d = 45°$ (angles of an isosceles trapezium are paired and sum to 360°)

 $e = 90°$ (angles must sum to the interior angle)

 c $f = 144°$ (interior angles of an decagon sum to 1440°)

 $g = 36°$ (angles of an isosceles trapezium are paired and sum to 360°)

 $h = 108°$ (angles must sum to the interior angle)

10a 0.36°   **11a** 72°

 b 179.64°   **b** 60°

             c 45°

        12 258°

6 Strengthen

Ordering and rounding decimals

1 a 8.3, 8.4, 9.2, 9.5

  b 0.006, 0.055, 0.06, 0.55, 0.606
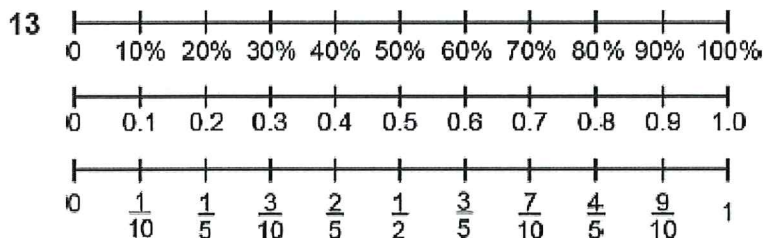
2 a 0.75

  b 0.77

  c 0.75

  d 0.75

3 £1.43

Add and subtract decimals

4 a 24.7

  b 84.9

5 a 8.13

  b 13.15

6 a 3.48

  b 23.08

  c 6.402

Multiply and divide decimals

7 a 5.2

  b 64.5

  c 40.52

8 a 2.4

  b 14

  c 0.24

  d 1.8

9 a 0.25

  b 0.028

  c 0.004

10 a 2.132

  b 0.6784

11 a 14.1

  b 7.23

12 a 40

  b 30

  c 700

  d 20

Fractions decimals and percentages

13

14 1.33

15 a 0.4

  b 4.4

  c £1.40

  d £40.60

16 a £70

  b 52 ml

17 60