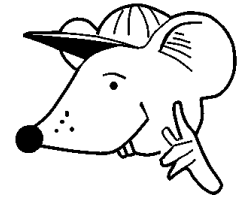# MATHEMATICS

Y6 Fractions
6365

Round decimals.
Equivalence between decimals and fractions

Equipment

Paper, pencil, ruler
Fraction cards
Calculator

MathSphere

Concepts

Children are expected to be able to round decimals with one or two decimal places to the nearest whole number.

Children need reminding about their year 5 work on rounding decimals They need to be shown again which digit is important when rounding decimals.

For instance, when rounding to the nearest tenth or to one decimal place, the hundredth digit is the important one to consider.

| 7.00 | 7.01 | 7.02 | 7.03 | 7.04 | 7.05 | 7.06 | 7.07 | 7.08 | 7.09 | 7.10 |

7.0 ←   → **7.1**
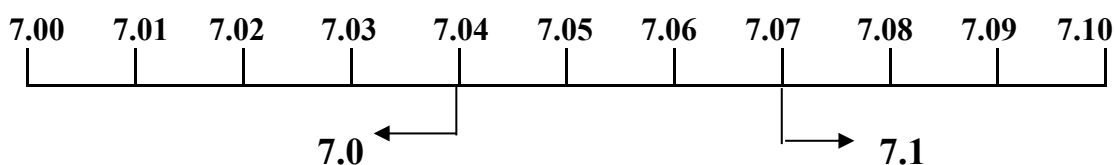
Further work of this kind is found in the rounding up and down after division.

The relationship between fractions and decimal fractions is a crucial one to develop further. This should be done with fractions up to thousandths.

Again, the calculator can be used, with the fraction e.g. **8/1000** being seen as a division sum: **8 ÷ 1 000 = 0.008**

A calculator can also be used to compare fractions.

Games such as snap, or matching cards, are very good ways of building this relationship. A number of cards can be found at the end of this module. It is suggested that they are photocopied onto card to give them extra strength.

Rounding to the nearest whole one - revision

When rounding to the nearest whole one the important figure is the number of tenths. This is the first number after the decimal point.
If the tenths are 5 or above round to the next whole number.
If the tenths are below 5 round down - to the whole number as it already is.
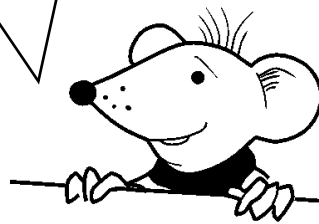
| 6.00 | 6.10 | 6.20 | 6.30 | 6.40 | 6.50 | 6.60 | 6.70 | 6.80 | 6.90 | 7.00 |

6.48 is rounded down to 6   **6.53 is rounded up to 7**

There is no need to look at the hundredths, when rounding to the nearest whole one.

Round these amounts to the nearest whole one:

1. 6.71

2. 2.88

3. 3.38

4. 4.5

5. 7.05

6. 6.2
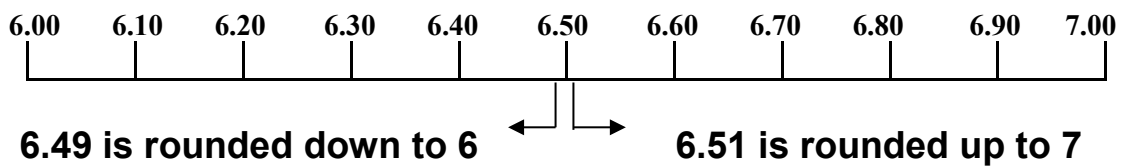
Remember to look at the tenths - don't worry about the hundredths!

Round these lengths to the nearest whole metre:

7. 5.56 m	**8.** 8.23 m	**9.** 4.15 m	**10.** 22.9 m
11. 16.66 m	**12.** 5.92 m	**13.** 8.05 m	**14.** 81.99 m
15. 12.83 m	**16.** 9.98 m		

Rounding to the nearest whole one - revision

Remember to look at the first digit after the decimal point to decide whether to round up or down. If it is 5 or more, round up!

| 6.00 | 6.10 | 6.20 | 6.30 | 6.40 | 6.50 | 6.60 | 6.70 | 6.80 | 6.90 | 7.00 |

6.49 is rounded down to 6   **6.51 is rounded up to 7**

There is no need to look at the hundredths when rounding to the nearest whole one.

Round these amounts to the nearest whole one:

1. 7.77

2. 6.66

3. 5.55

4. 4.44

5. 3.33

6. 2.22

Getting the idea of these, I hope!

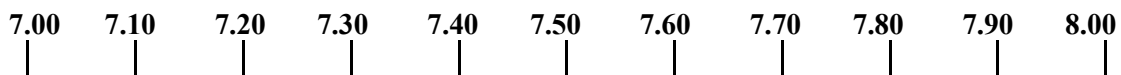**Round these lengths to the nearest whole metre:**

7. 8.17 m	**8.** 3.04 m	**9.** 16.98 m	**10.** 10.54 m
11. 6.90 m	**12.** 1.84 m	**13.** 40.01m	**14.** 76.99 m
15. 15.90 m	**16.** 2.41 m		

Rounding to the nearest whole one - thousandths

When rounding a number with thousandths into the nearest whole one, the important figure is still the number of tenths. This is the first number after the decimal point.
If the tenths are 5 or above round to the next whole number.
If the tenths are below 5 round down - to the whole number as it already is.

| 7.00 | 7.10 | 7.20 | 7.30 | 7.40 | 7.50 | 7.60 | 7.70 | 7.80 | 7.90 | 8.00 |

7.485 is rounded down to 7   **7.532 is rounded up to 8**

There is no need to look at the hundredths, or thousandths, when rounding to the nearest whole one.

Round these amounts to the nearest whole one:

1. 7.842

2. 3.909

3. 4.832

4. 4.588

5. 8.109

6. 7.327

Remember after the decimal point it's tenths, then hundredths, then thousandths!

Round these masses to the nearest whole kilogramme:

7. 5.567 kg   **8.** 6.439 kg   **9.** 2.199 kg   **10.** 2.999 kg

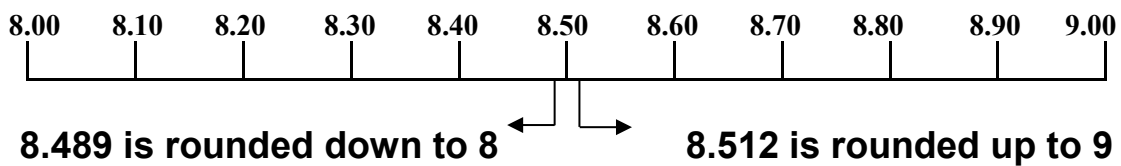**11.** 4.567 kg   **12.** 9.524 kg   **13.** 7.099 kg

14. 7.277 kg   **15.** 8.631 kg   **16.** 9.009 kg

Rounding to the nearest whole one - revision

Remember to look at the first digit after the decimal point to decide whether to round up or down. If it is 5 or more, round up!

| 8.00 | 8.10 | 8.20 | 8.30 | 8.40 | 8.50 | 8.60 | 8.70 | 8.80 | 8.90 | 9.00 |

8.489 is rounded down to 8   **8.512 is rounded up to 9**

There is no need to look at the hundredths or thousandths when rounding to the nearest whole one.

Round these amounts to the nearest whole one:

1. 2.345

2. 3.456

3. 4.567

4. 5.678

5. 6.789

6. 7.890

Getting the idea of these, I hope!

Round these lengths to the nearest whole kilometre:

7. 9.270 km   **8.** 4.089 km   **9.** 7.455 km   **10.** 6.288 km

11. 1.009 km   **12.** 2.555 km   **13.** 6.099 km

14. 6.900 km   **15.** 6.090 km   **16.** 6.909 km

Rounding to the nearest tenth

When rounding to the nearest tenth it is the hundredth column which becomes important.

£6.00   £6.01   £6.02   £6.03   £6.04   £6.05   £6.06   £6.07   £6.08   £6.09   £6.10
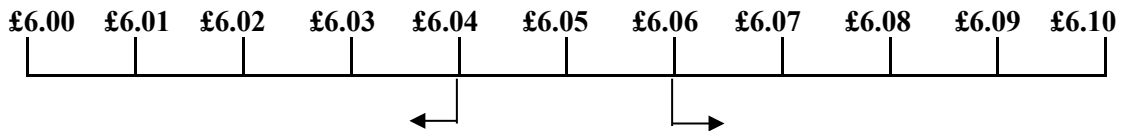
6.04 is rounded down to 6.0   6.06 is rounded up to 6.1

What are these amounts to the nearest ten pence (rounding to tenths)?

1. £6.74

2. £2.81

3. £8.35

4. £8.42

5. £5.57

6. £1.23

Now we look at the hundredths!

Round these lengths to the nearest ten cm (nearest tenth):

 7. 9.17 m   **8.** 4.04 m   **9.** 17.98 m   **10.** 11.54 m

11. 7.96 m   **12.** 2.84 m   **13.** 50.03 m

14. 86.99 m   **15.** 25.92 m   **16.** 3.41 m

Rounding to the nearest tenth

When rounding to the nearest tenth it is the hundredth column which becomes important.

£7.10   £7.11   £7.12   £7.13   £7.14   £7.15   £7.16   £7.17   £7.18   £7.19   £7.20
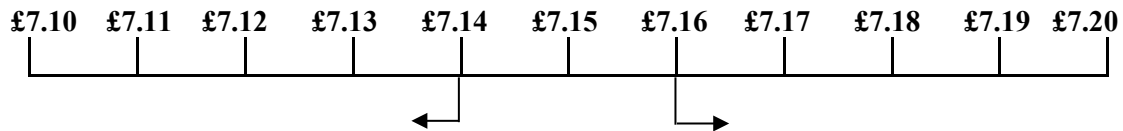
7.14 is rounded down to 7.1   **7.16 is rounded up to 7.2**

What are these amounts to the nearest ten pence (rounding to tenths)?

1. £8.77

2. £4.51

3. £7.08

4. £12.73

5. £23.36

6. £17.77

Each of your answers should have a nought in the pence column! Check to see that you have!

Round these lengths to the nearest ten cm (nearest tenth):

7. 7.95 m   **8.** 2.02 m   **9.** 19.18 m   **10.** 13.76 m

11. 9.18 m   **12.** 4.06 m   **13.** 52.75 m

14. 8.02 m   **15.** 27.77 m   **16.** 5.93 m

Rounding to the nearest tenth

When rounding to the nearest tenth it is the **hundredth** column which becomes important.

| 4.10 | 4.11 | 4.12 | 4.13 | 4.14 | 4.15 | 4.16 | 4.17 | 4.18 | 4.19 | 4.20 |

4.142 is rounded down to 4.1   **4.163 is rounded up to 4.2**

What are these lengths to the nearest tenth, or to one decimal place

1. 7.756 km

2. 3.288 km

3. 7.501 km

4. 8.455 km

5. 9.990 km

6. 7.001 km

Now we look at the hundredths!

Round these lengths to the nearest tenth (or one decimal place)?

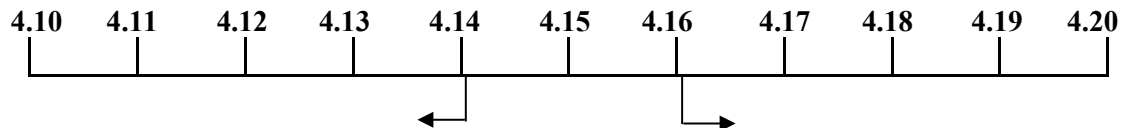| **7.** 8.08 m | **8.** 5.05 m | **9.** 16.87 m | **10.** 22.43 m |
| **11.** 6.17 m | **12.** 2.678 m | **13.** 4.499 m | |
| **14.** 7.303 m | **15.** 6.606 m | **16.** 7.777 m | |

Rounding to the nearest tenth - revision

When rounding to the nearest tenth it is the hundredth column which becomes important.

| 7.20 | 7.21 | 7.22 | 7.23 | 7.24 | 7.25 | 7.26 | 7.27 | 7.28 | 7.29 | 7.30 |
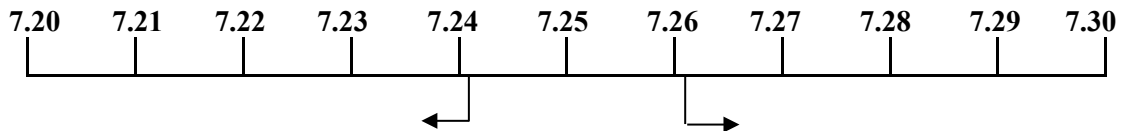
7.242 is rounded down to 7.2   **7.262 is rounded up to 7.3**

What are these lengths to the nearest tenth (or one decimal place)?

1. 4.616 km

2. 1.029 km

3. 9.931 km

4. 8.949 km

5. 7.059 km

6. 0.066 km

> 4.616 km is 4 kilometres and 616 metres. That's a long way for someone like me!!

Round these lengths to the nearest ten cm (nearest tenth):

7. 8.01 m	**8.** 9.95 m	**9.** 17.99 m	**10.** 19.98 m
11. 0.17 m	**12.** 6.72 m	**13.** 55.55 m	
14. 1.09 m	**15.** 22.22 m	**16.** 7.65 m	

Fractions and decimal fractions

Most calculators do not display fractions as you usually write them.

Remember it is easy to change fractions into decimal fractions using a calculator.

$\frac{1}{2}$ means 1 divided by 2 or $1 \div 2$.

Do this on a calculator: enter $1 \div 2 =$

The answer 0.5 will come up.

This means that $\frac{1}{2}$ is the same as 0.5

In the same way, using a calculator, find the decimal fraction for these fractions. Complete all parts of the table below.

FRACTION	DECIMAL
$\frac{1}{2}$	
$\frac{2}{2}$	
$\frac{1}{3}$	
$\frac{2}{3}$	
$\frac{3}{3}$	
Can you see a pattern?	

FRACTION	DECIMAL
$\frac{1}{4}$	
$\frac{2}{4}$	
$\frac{3}{4}$	
$\frac{4}{4}$	
Can you see a pattern?	

Converting fractions to decimals

Complete the table below, putting in the fractions and decimal equivalence. Look for patterns all the time - some interesting numbers come up on your calculator!

FRACTION	DECIMAL
$\frac{1}{5}$	
$\frac{2}{5}$	

Can you see a pattern?

FRACTION	DECIMAL
$\frac{1}{6}$	

What is the pattern in the sixths?

FRACTION	DECIMAL
$\frac{1}{7}$	
$\frac{2}{7}$	

Look hard for a pattern in the sevenths!

FRACTION	DECIMAL
$\frac{1}{8}$	
$\frac{8}{8}$	

Converting fractions to decimals

Continue using your calculator to find the decimal equivalence of ninths and tenths. Fill in all the table for one ninth to nine ninths and one tenth to ten tenths. Look for patterns all the time - some interesting numbers come up on your calculator with the ninths!

FRACTION	DECIMAL
$\frac{1}{9}$	
$\frac{2}{9}$	
$\frac{9}{9}$	

Can you explain the pattern in the ninths?

FRACTION	DECIMAL
$\frac{1}{10}$	
$\frac{5}{10}$	
$\frac{10}{10}$	

Can you explain the pattern in the tenths?

Equivalent Fractions

Having found all the decimals for fractions from $\frac{1}{2}$ to $\frac{10}{10}$ you

might have noticed that some fractions give the same decimal. For example:

$$\frac{1}{2} = 0.5 \quad \text{and} \quad \frac{2}{4} \text{ also} = 0.5$$

This means that $\frac{1}{2}$ and $\frac{2}{4}$ are equal.

In the box below write down all the fractions, up to ten tenths, that are equal to those on the left:

FRACTION	EQUIVALENT FRACTIONS
$\frac{1}{2}$	
$\frac{2}{2}$	
$\frac{1}{3}$	
$\frac{1}{4}$	
$\frac{1}{5}$	

Fractions and decimal fractions.

Remember it is easy to change fractions into decimal fractions using a calculator.

This can also be done with fractions with thousandths.

$\dfrac{1}{1000}$ means 1 divided by 1000 or   1 ÷ 1000

Do this on a calculator: enter 1 ÷ 1 000 =

The answer 0.001 will come up.

This means that $\dfrac{1}{1000}$ is the same as 0.001 (one thousandth)

In the same way, using a calculator, find the decimal fraction for these fractions. Complete all parts of the table below.

FRACTION	DECIMAL
$\dfrac{1}{1000}$	
$\dfrac{2}{1000}$	
$\dfrac{3}{1000}$	
$\dfrac{4}{1000}$	
$\dfrac{5}{1000}$	
Can you see a pattern?	

FRACTION	DECIMAL
$\dfrac{21}{1000}$	
$\dfrac{31}{1000}$	
$\dfrac{41}{1000}$	
$\dfrac{51}{1000}$	
Can you see a pattern?	

Converting decimals to fractions

0.1 is one tenth and can be written as $\dfrac{1}{10}$

0.01 is one hundredth and can be written as $\dfrac{1}{100}$

0.001 is one thousandth and can be written as $\dfrac{1}{1000}$

In the same way convert these decimals into fractions:

	decimal	written as…	fraction
1.	0.7	is seven tenths	$\dfrac{7}{10}$
2.	0.5	is	
3.	0.03	is	
4.	0.004	is	
5.	0.09	is	
6.	0.03	is	
7.	0.009	is	
8.	0.04	is	

Converting decimals to fractions

0.21   is twenty one hundredths or $\dfrac{21}{100}$

0.456 is four hundred and fifty six thousandths or $\dfrac{456}{1000}$

0.021 is twenty one thousandths or $\dfrac{21}{1000}$

In the same way convert these decimals into fractions:

	decimal	written as…	fraction
1.	0.15	is fifteen hundredths	$\dfrac{15}{100}$
2.	0.35	is	
3.	0.08	is	
4.	0.28	is	
5.	0.123	is	
6.	0.235	is	
7.	0.105	is	
8.	0.444	is	

Mixed numbers as decimals

$5\frac{551}{1000}$ can be written as 5.551 when using a calculator.

Write these mixed numbers as decimal fractions:

1.	$7\frac{337}{1000}$ =
2.	$3\frac{665}{1000}$ =
3.	$1\frac{901}{1000}$ =
4.	$6\frac{25}{1000}$ =
5.	$3\frac{41}{1000}$ =
6.	$4\frac{2}{1000}$ =
7.	$2\frac{101}{1000}$ =
8.	$7\frac{333}{1000}$ =

Not as difficult as it looks!
I'll finish these in a couple of minutes!

6365   Round decimals. Equivalence between fractions and decimals   Page 19

© MathSphere   www.mathsphere.co.uk
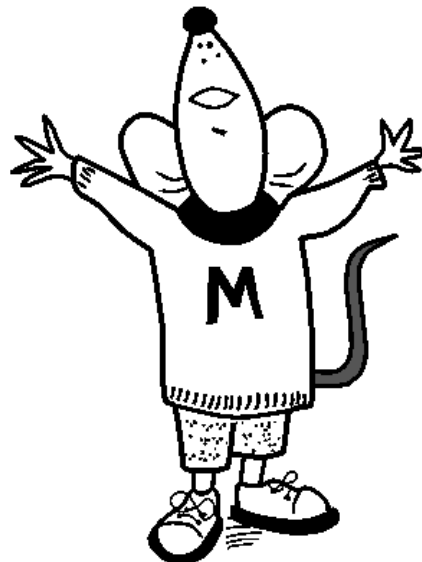
Mixed numbers as decimal fractions - extension

$5\frac{31}{100}$ can be written as 5.31 when using a calculator.

Write these mixed numbers as decimal fractions:

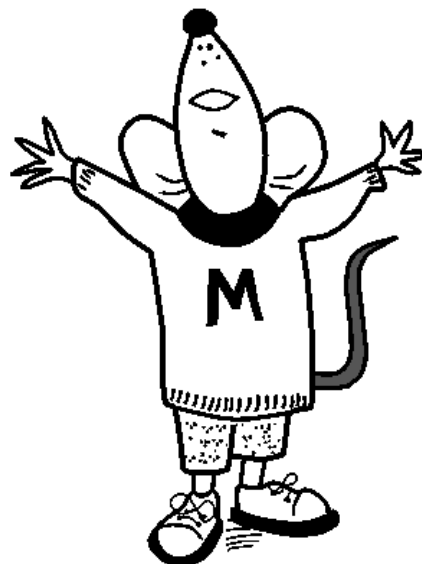|	
1.	$7\frac{47}{100}$
2.	$3\frac{85}{100}$
3.	$1\frac{91}{100}$
4.	$6\frac{5}{100}$
5.	$3\frac{61}{100}$
6.	$4\frac{4}{100}$
7.	$2\frac{1}{100}$
8.	$7\frac{3}{100}$

0.65 is sixty five hundredths.

0.05 is five hundredths.

Using calculator to decide size of fractions

When faced with fractions with different denominators (bottom numbers) it is often difficult to tell which is the larger fraction.

If the fractions are treated as division sums, then it is easy to use a calculator to work out which is the larger.

For example: which is larger; $\frac{3}{4}$ or $\frac{18}{25}$

$\frac{3}{4}$ is 0.75 whilst $\frac{18}{25}$ is 0.72   so $\frac{3}{4}$ is larger than $\frac{18}{25}$

Work out which is the larger fraction in each of these pairs of fractions:

1. $\frac{5}{9}$ **or** $\frac{67}{100}$ 2. $\frac{13}{45}$ **or** $\frac{383}{999}$

3. $\frac{56}{60}$ **or** $\frac{8}{9}$ 4. $\frac{12}{1000}$ **or** $\frac{7}{500}$

5. $\frac{17}{120}$ **or** $\frac{14}{101}$ 6. $\frac{7}{60}$ **or** $\frac{56}{200}$

Use your calculator to place these fractions in order of size (smallest first):

7. $\frac{3}{8}$ $\frac{4}{9}$ $\frac{43}{90}$ $\frac{21}{50}$ $\frac{467}{900}$

8. $\frac{9}{20}$ $\frac{3}{7}$ $\frac{28}{40}$ $\frac{179}{350}$ $\frac{143}{300}$

Using calculator to decide size of fractions

When faced with fractions with different denominators (bottom numbers) it is often difficult to tell which is the larger fraction.

If the fractions are treated as division sums, then it is easy to use a calculator to work out which is the larger.

For example: which is larger; $\dfrac{4}{9}$ or $\dfrac{17}{38}$

$\dfrac{4}{9}$ is   0.444   whilst $\dfrac{17}{38}$ is 0.447   so $\dfrac{17}{38}$ is larger than $\dfrac{4}{9}$

Work out which is the larger fraction in each of these pairs of fractions:

1. $\dfrac{6}{11}$ **or** $\dfrac{517}{1000}$ 2. $\dfrac{27}{80}$ **or** $\dfrac{353}{1000}$

3. $\dfrac{34}{70}$ **or** $\dfrac{5}{9}$ 4. $\dfrac{13}{20}$ **or** $\dfrac{41}{60}$

5. $\dfrac{27}{114}$ **or** $\dfrac{13}{51}$ 6. $\dfrac{9}{61}$ **or** $\dfrac{42}{300}$

Use your calculator to place these fractions in order of size, beginning with the smallest:

7. $\dfrac{4}{7}$ $\dfrac{5}{9}$ $\dfrac{43}{90}$ $\dfrac{20}{47}$ $\dfrac{199}{469}$

8. $\dfrac{12}{13}$ $\dfrac{45}{47}$ $\dfrac{241}{258}$ $\dfrac{13}{14}$ $\dfrac{133}{144}$

Answers

Page 3
1. 7   **2.** 3   **3.** 3   **4.** 5   **5.** 7   **6.** 6   **7.** 6m   **8.** 8m
9. 4m   **10.** 23m   **11.** 17m   **12.** 6m   **13.** 8m   **14.** 82m   **15.** 13m   **16.** 10m

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Page 4
1. 8   **2.** 7   **3.** 6   **4.** 4   **5.** 3   **6.** 2   **7.** 8m   **8.** 3m
9. 17m   **10.** 11m   **11.** 7m   **12.** 2m   **13.** 40m   **14.** 77m   **15.** 16m   **16.** 2m

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

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

---

Page 7
1. £6.70   **2.** £2.80   **3.** £8.40   **4.** £8.40   **5.** £5.60   **6.** £1.20   **7.** 9.2m   **8.** 4.0m
9. 18.0m **10.** 11.5m **11.** 8.0m   **12.** 2.8m   **13.** 50.0m **14.** 87.0m   **15.** 25.9m **16.** 3.4m

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Page 8
1. £8.80   **2.** £4.50   **3.** £7.10   **4.** £12.70   **5.** £23.40   **6.** £17.80   **7.** 8.0m   **8.** 2.0m
9. 19.2m **10.** 13.8m **11.** 9.2m   **12.** 4.1m   **13.** 52.8m **14.** 8.0m   **15.** 27.8m   **16.** 5.9m

---

Page 9
1. 7 .8 km   **2.** 3.3 km   **3.** 7.5 km   **4.** 8.5 km   **5.** 10.0 km   **6.** 7.0 km
7. 8.1 m   **8.** 5.1 m   **9.** 16.9 m   **10.** 22.4 m   **11.** 6.2 m   **12.** 2.7 m
13. 4.5 m   **14.** 7.3 m   **15.** 6.6 m   **16.** 7.8 m

Page 10
1. 4.6 km   **2.** 1.0 km   **3.** 9.9 km   **4.** 8.9 km   **5.** 7.1 km   **6.** 0.1 km
7. 8.0 m   **8.** 10.0 m   **9.** 18.0 m   **10.** 20.0 m   **11.** 0.2 m   **12.** 6.7 m
13. 55.6 m   **14.** 1.1 m   **15.** 22.2 m   **16.** 7.7 m

Page 11   (recurring numbers after the decimal will depend on calculator)
1/2 = 0.5   2/2 = 1   1/3 = 0.3333333   2/3 = 0.6666666   3/3 = 1
1/4 = 0.25   2/4 = 0.5   3/4 = 0.75   4/4 = 1   Discuss patterns of numbers

Page 12
1/5 = 0.2   2/5 = 0.4   3/5 = 0.6   4/5 = 0.8   5/5 = 1
1/6 = 0.166667 2/6 = 0.333333 3/6 = 0.5 4/6 = 0.666667 5/6 = 0.833333 6/6 = 1
1/7 = 0.142857   2/7 = 0.285714   3/7 = 0.428571   4/7 = 0.571428
5/7 = 0.714285   6/7 = 0.857142   7/7 = 1
1/8 = 0.125   2/8 = 0.25   3/8 = 0.375   4/8 = 0.5   5/8 = 0.625   6/8 = 0.75
7/8 = 0.875   8/8 = 1
Discuss patterns in decimals

Page 13
1/9 = 0.111111   2/9 = 0.222222   3/9 = 0.333333   4/9 = 0.444444   5/9 = 0.555555
6/9 = 0.666666   7/9 = 0.777777   8/9 = 0.888888   9/9 = 1
1/10 = 0.1   2/10 = 0.2   3/10 = 0.3   4/10 = 0.4   5/10 = 0.5
6/10 = 0.6   7/10 = 0.7   8/10 = 0.8   9/10 = 0.9   10/10 = 1
Discuss patterns in decimals

Page 14
1/2 = 2/4 = 3/6 = 4/8 = 5/10
2/2 = 3/3 = 4/4 = 5/5 = 6/6 = 7/7 = 8/8 = 9/9 = 10/10 = 1
1/3 = 2/6 = 3/9   1/4 = 2/8   1/5 = 2/10

Page 15   (recurring numbers after the decimal will depend on calculator)
1/1000 = 0.001   2/1000 = 0.002   3/1000 = 0.003   4/1000 = 0.004   5/1000 = 0.005
discuss pattern shown
21/1000 = 0.021   31/1000 = 0.031   41/1000 = 0.041   51/1000 = 0.051 discuss

Page 16
1.   0.7 is seven tenths   7/10   2. 0.5 is five tenths   5/10
3.   0.03 is three hundredths   3/100   4. 0.004 is four thousandths   4/1000
5.   0.09 is nine hundredths   9/100   6. 0.03 is three hundredths   3/100
7.   0.009 is nine thousandths   9/1000   8. 0.04 is four hundredths   4/100

Page 17
1. 0.15 is fifteen hundredths   15/100   2. 0.35 is thirty five hundredths 35/100
3. 0.08 is eight hundredths   8/100   4. 0.28 is twenty eight hundredths 28/100
5. 0.123 is one hundred and twenty three thousandths   123/1000
6. 0.235 is two hundred and thirty five thousandths   235/1000
7. 0.105 is one hundred and five thousandths   105/1000
8. 0.444 is four hundred and forty four thousandths   444/1000

Page 18
1. 7.337   2. 3.665   3. 1.901   4. 6.025
5. 3.041   6. 4.002   7. 2.101   8. 7.333

Page 19
1. 7.47   2. 3.85   3. 1.91   4. 6.05   5. 3.61   6. 4.04   7. 2.01   8. 7.03

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1. 67/100   **2.** 383/999   **3.** 56/60   **4.** 7/500

5. 17/120   **6.** 56/200

7. 3/8   21/50   4/9   43/90   467/900

8. 3/7   9/20   143/300   179/350   28/40

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1. 6/11   **2.** 353/1000   **3.** 5/9   **4.** 41/60   **5.** 13/51   **6.** 9/61

7. 199/469   20/47   43/90   5/9   4/7

8. 12/13   133/144   13/14   241/258   45/47

0.01	**0.02**
0.03	**0.04**
0.05	**0.06**
0.07	**0.08**
0.09	**0.10**
0.11	**0.12**

1/100	**2/100**
3/100	**4/100**
5/100	**6/100**
7/100	**8/100**
9/100	**10/100**
11/100	**12/100**

13/100	**14/100**
15/100	**16/100**
17/100	**18/100**
19/100	**20/100**
21/100	**22/100**
23/100	**24/100**

0.13	**0.14**
0.15	**0.16**
0.17	**0.18**
0.19	**0.20**
0.21	**0.22**
0.23	**0.24**