



MATHEMATICS



N.S. Yr. 5 P.31

**Round decimal fractions.
Recognise equivalence between
decimals and fractions**

Equipment

Paper, pencil, ruler
Fraction cards
Calculator

MathSphere

© MathSphere P.O. Box 1234 Worthing BN13 2UJ www.mathsphere.co.uk

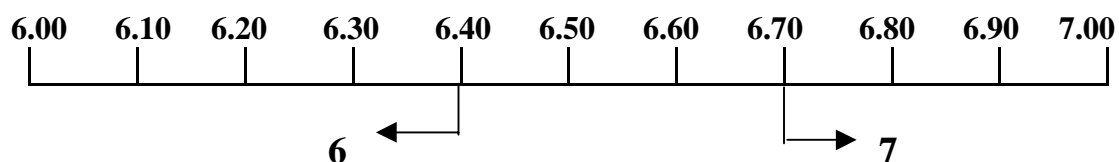
Concepts

Children are expected to be able to round decimal fractions to the nearest whole number. Most of this kind of work should be carried out in the context of money, length or weight.

In a similar way to rounding larger numbers, the children need to be shown which digit is important when rounding decimals.

For instance, when rounding to the nearest whole number, the tenths digit is the important one to consider.

If the tenths are 5 or more - round up.



(When rounding to the nearest tenth, then the hundredths digit is the key one.)

When using a calculator, children need to be aware that in the context of money 4.5 means £4.50 - the calculator will leave out any unnecessary noughts after the decimal point.

When using a calculator to add mixed units, e.g. £2.48 + 67p then the 67p has to be entered as 0.67. Whilst this is relatively easy to do with pencil and paper methods it is also a good test of children's knowledge and understanding of place value.

The relationship between fractions and decimal fractions is a crucial one to develop. Initially, this will be with simple fractions such as $\frac{1}{2}$ and $\frac{1}{4}$ as well as tenths.

Again, the calculator can be used, with the fraction e.g. $\frac{7}{10}$ being seen as a division sum: $7 \div 10 = 0.7$

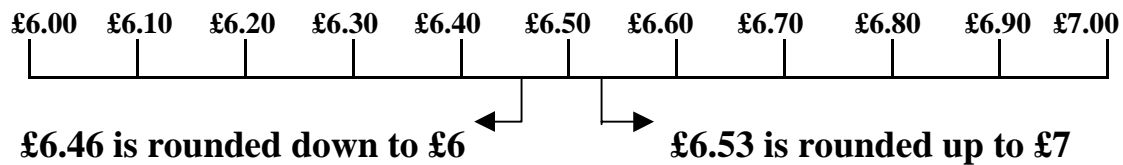
Games such as snap, or matching cards, are very good ways of building this relationship. A number of cards can be found at the end of this module. It is suggested that they are photocopied onto card to give them extra strength.

Rounding to the nearest whole one

When rounding amounts of money to the nearest whole pound the important figure is the number of tenths, or ten pence pieces. This is the first number after the decimal point.

If the tenths are 5 or above round to the next whole pound.

If the tenths are below 5 round down - to the pounds as they already are.



There is no need to look at the hundredths (or pence) when rounding to the nearest pound.

Round these amounts to the nearest pound:

1. £5.82
2. £3.71
3. £2.49
4. £9.09
5. £6.73
6. £8.50

Now, 50p is half way -
what do I do? Round up
or down?

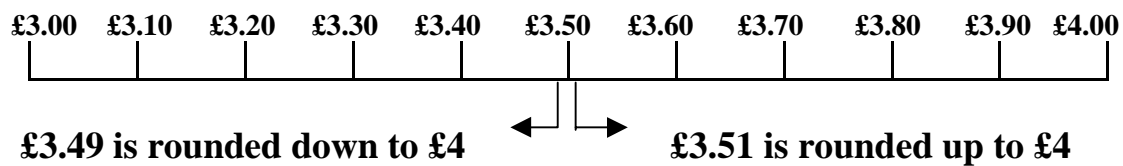


Round these lengths to the nearest whole metre:

- | | | | | |
|-----------|-----------|------------|------------|------------|
| 7. 4.4 m | 8. 9.1 m | 9. 23.2 m | 10. 3.7 m | 11. 4.8 m |
| 12. 4.9 m | 13. 7.3 m | 14. 50.1 m | 15. 73.0 m | 16. 59.6 m |

Rounding to the nearest whole one

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!



There is no need to look at the hundredths (or pence) when rounding to the nearest pound.

Round these amounts to the nearest pound:

1. £4.51
2. £5.39
3. £0.61
4. £61.75
5. £78.93
6. £27.59

These are easy, when you know how!



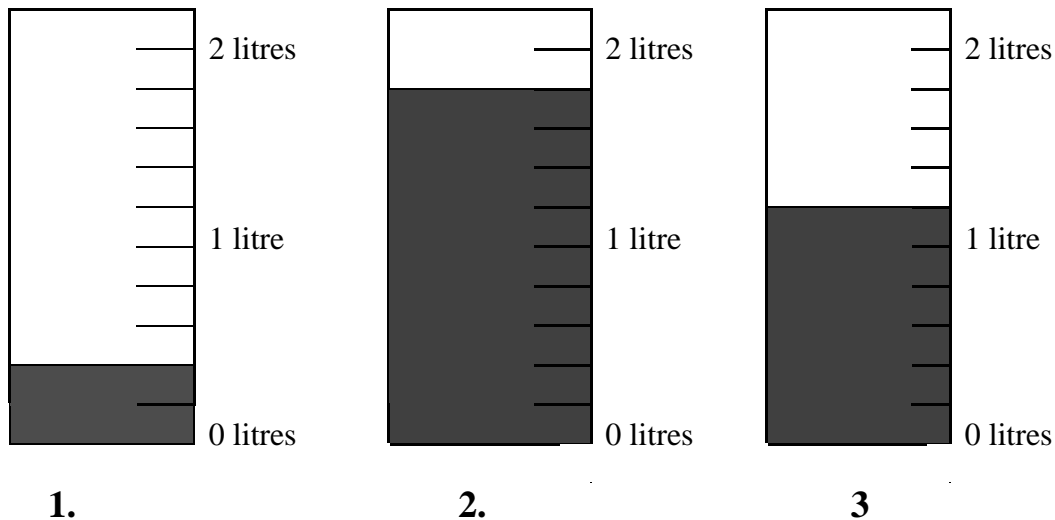
Round these lengths to the nearest whole metre:

- | | | | | |
|-----------|-----------|------------|------------|------------|
| 7. 7.1 m | 8. 8.1 m | 9. 15.9 m | 10. 9.5 m | 11. 5.9 m |
| 12. 0.8 m | 13. 49.0m | 14. 73.9 m | 15. 14.9 m | 16. 10.4 m |

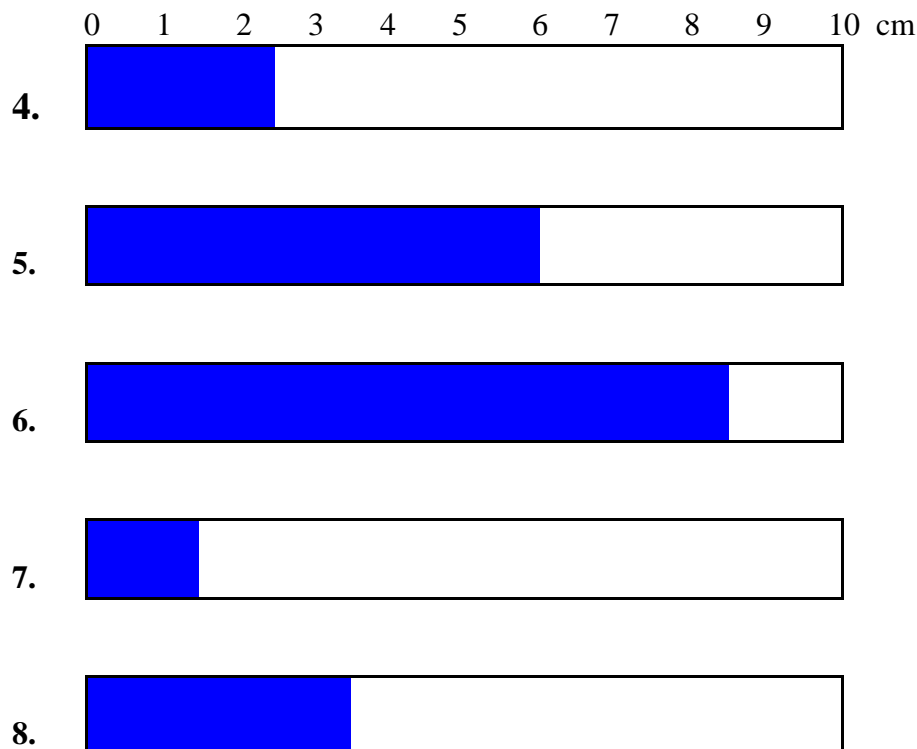
Rounding to the nearest half

Often when we are measuring in real life we say, "It's about two and a half litres," or, "that's about three and a half metres."

Below are some measuring jugs. To the nearest half litre write down how much is in each. Remember that a whole number can be a correct answer when measuring to the nearest half - e.g. it is about three litres when it is quite a lot more than two and a half litres.

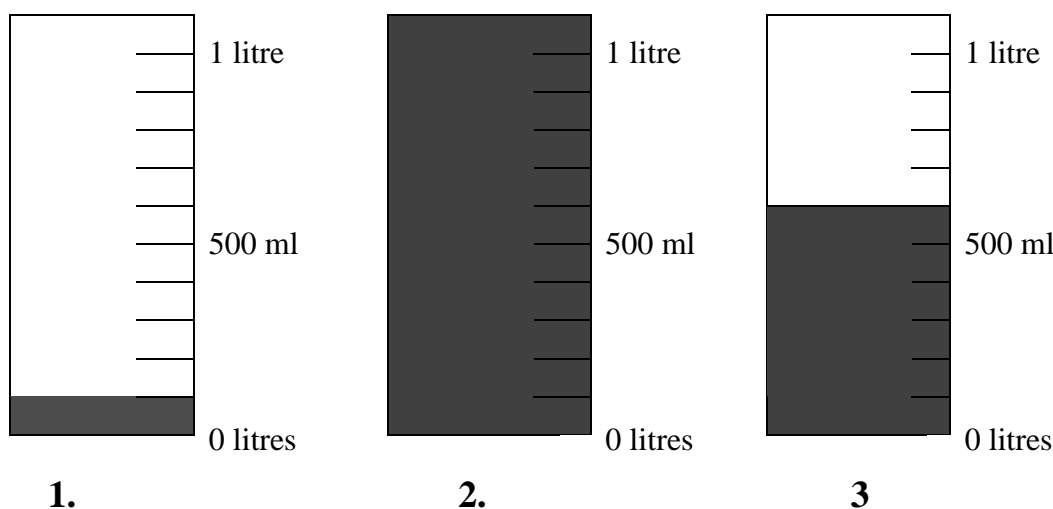


Estimate the lengths of these lines to the nearest half centimetre:

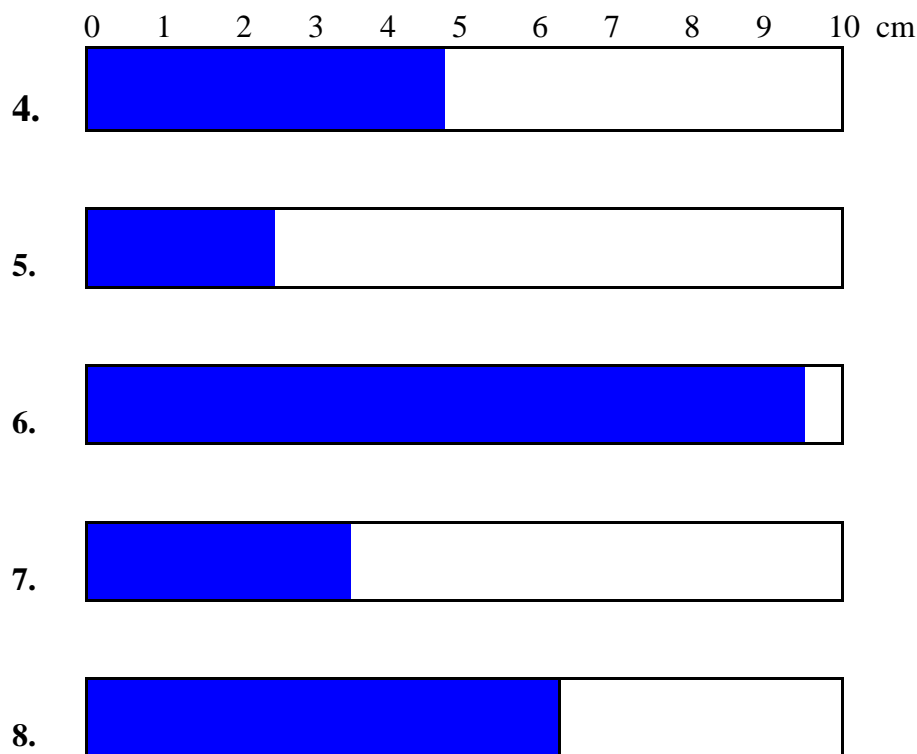


Rounding to the nearest half

Below are some measuring jugs. To the nearest half litre write down how much is in each. Remember that a whole number can be a correct answer when measuring to the nearest half - e.g. it is about three litres when it is quite a lot more than two and a half litres.



Estimate the lengths of these lines to the nearest half centimetre:



Fractions and decimal fractions

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

But 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.

$\frac{3}{4}$	Means 3 divided by 4	$3 \div 4 =$	0.75
$\frac{3}{10}$	Means 3 divided by 10	$3 \div 10 =$	
$\frac{5}{10}$	Means 5 divided by 10		
$\frac{9}{10}$	Means		
$\frac{1}{4}$	Means		
$\frac{4}{10}$	Means		

Fractions and decimal fractions

Most calculators do not display fractions as you usually see them, but it can display them as decimal fractions.

$\frac{12}{100}$ can be thought of as twelve divided by one hundred
 or $12 \div 100$ which equals 0.12

Do this on a calculator: enter $12 \div 10 =$

The answer 0.12 will come up.

This means that $\frac{12}{100}$ is the same as 0.12

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

$\frac{13}{100}$	Means 13 divided by 100	$13 \div 100 =$	0.13
$\frac{1}{10}$	Means divided by	$1 \div 10 =$	
$\frac{52}{100}$	Means 52 divided by 100		
$\frac{26}{100}$	Means		
$\frac{11}{100}$	Means		
$\frac{2}{10}$	Means		

Mixed numbers as decimal fractions - extension

$4\frac{2}{10}$ can be written as 4.2 when using a calculator.

This is because $\frac{2}{10}$ means $2 \div 10$ which is 0.2

Write these mixed numbers as decimal fractions:

1. $7\frac{34}{100}$

2. $3\frac{14}{100}$

3. $1\frac{3}{4}$

4. $6\frac{1}{10}$

5. $3\frac{1}{2}$

6. $4\frac{99}{100}$

7. $2\frac{7}{100}$

8. $5\frac{61}{100}$

Just think of a
fraction as a
division sum - it's
easy then!
Three quarters
means 3 divided
by 4.....



Mixed numbers as decimal fractions - extension

$5\frac{3}{10}$ can be written as 5.3 when using a calculator.

Write these mixed numbers as decimal fractions:

1. $6\frac{45}{100}$

2. $4\frac{25}{100}$

3. $2\frac{9}{10}$

4. $7\frac{1}{100}$

5. $4\frac{33}{100}$

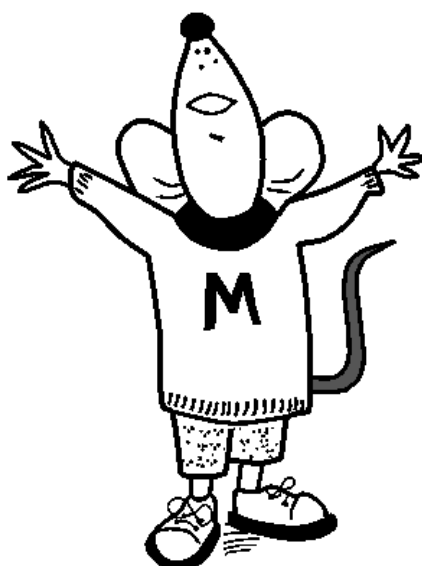
6. $5\frac{9}{100}$

7. $3\frac{17}{100}$

8. $5\frac{63}{100}$

99 hundredths is
0.99

Now that is very
nearly one whole
one!



Decimal fractions to fractions

The first number after the decimal point is in the tenths column.

So, 0.3 means 3 tenths. It can also be written as $\frac{3}{10}$

0.03 means 3 hundredths. It can be written as $\frac{3}{100}$

0.33 means 3 tenths and 3 hundredths or 33 hundredths.

It can be written as $\frac{33}{100}$

Write down the fractions which equal these decimals:

1. 0.3 2. 0.7 3. 0.17 4. 0.37 5. 0.53

6. Which of these decimals is equal to $\frac{9}{10}$?

9.9 0.19 0.99 0.9 0.910

7. Which of these decimals is equal to $\frac{27}{100}$?

0.2710 0.127 2.7 2.700 0.27

Remember: 0.2 and 0.20 are the same - each equals two tenths.

The calculator will not display any unnecessary 0s at the end of a decimal number. It will show £3.60 as 3.6

Write down how a calculator displays these numbers if they were to come up as the answer to a sum:

8. 1.200 9. 3.00 10. 4.100 11. 5.20 12. 6.10000

Decimal fractions to fractions

The first number after the decimal point is in the tenths column.

So, 0.4 means 4 tenths. It can also be written as $\frac{4}{10}$

0.04 means 4 hundredths. It can be written as $\frac{4}{100}$

0.44 means 4 tenths and 4 hundredths or 44 hundredths.

It can be written as $\frac{44}{100}$

Write down the fractions which equal these decimals:

1. 0.6 2. 0.9 3. 0.28 4. 0.49 5. 0.67

6. Which of these decimals is equal to $\frac{7}{10}$?

7.7 0.17 0.77 0.7 0.710

7. Which of these decimals is equal to $\frac{37}{100}$?

0.3710 0.317 3.700 0.37 3.7

Remember: 0.4 and 0.40 are the same - each equals four tenths.

The calculator will not display any unnecessary 0s at the end of a decimal number. It will show £4.70 as 4.7

Write down how a calculator displays these numbers if they were to come up as the answer to a sum:

8. 2.300 9. 50.00 10. 6.600 11. 9.10 12. 2.9000

Calculators with money problems

When using a calculator to add or subtract money, it is important to use the correct units.

For example: £5.78 + 89p

The 89p has to be put into the calculator as £0.89, not as 89, otherwise the addition will come to £94.78, which is obviously wrong!

Use a calculator to work out the answers to these sums involving money.

1. £7.78 + 63p + £5.59

7. £34.78 + £23.99 + 56p

2. £6.99 + 99p + £2.50

8. £99.99 + £12.99 + 99p

3. 89p + £13.76 + £32.89

9. £4.89 + £3.19 + 29p

4. £15.01 + £17.99 + 49p

10. 34p + 99p + £7.01

5. 67p + 45p + £2.30

11. 7p + £12.99 + £123.07

6. £12.99 + £12.99 + 99p

12. £22.89 + 9p + £35.99

In the same way, calculate these lengths in metres:

13. 2.35m + 76cm + 2.45m

14. 7.79m + 4.55m + 65cm

15. 9.9m + 8.79m + 33cm

16. 4.55m + 7cm + 5.99m

Think how to type in cm
when adding in metres...



Calculators with money problems

When using a calculator to add or subtract money, it is important to use the correct units.

For example: £6.89 + 72p

The 72p has to be put into the calculator as £0.72, not as 72, otherwise the addition will come to £78.89, which is obviously wrong!

Use a calculator to work out the answers to these sums involving money.

- | | |
|---------------------------------|-------------------------|
| 1. £8.89 + 73p + £6.60 | 7. £56.00 – 67p |
| 2. £7 + 94p + £3.88 | 8. £99.00 – 59p |
| 3. 59p + £14.87 + £44.08 | 9. £4.00 – 79p |
| 4. £16.99 + £37.99 + 79p | 10. £78.07 – 94p |
| 5. 78p + 56p + £3.40 | 11. £23.06 – 85p |
| 6. £13.99 + £72.99 + 99p | 12. £22.22 – 58p |

In the same way, calculate these lengths in metres:

- 13. 3.46m + 87cm + 3.50m**
- 14. 8.81m + 5.89m + 22cm**
- 15. 9.5m + 9.55m + 95cm**
- 16. 5.55m + 5cm + 5.5m**

These carefully on these!!



Answers**Page 3**

1. £6 2. £4 3. £2 4. £9 5. £7 6. £9 7. 4m 8. 9m
9. 23m 10. 4m 11. 5m 12. 5m 13. 7m 14. 50m 15. 73m 16. 60m

Page 4

1. £5 2. £5 3. £1 4. £62 5. £79 6. £28 7. 7m 8. 8m
9. 16m 10. 10m 11. 6m 12. 1m 13. 49m 14. 74m 15. 15m 16. 10m

Page 5

1. 1/2 litre 2. 2 litres 3. 1 litre 4. 2 1/2 cm 5. 6 cm 6. 8 1/2 cm 7. 11 1/2 cm 8. 3 1/2 cm

Page 6

1. 0 litres 2. 1 litre 3. 1/2 litre 4. 5 cm 5. 2 1/2 cm 6. 9 1/2 cm 7. 3 1/2 cm 8. 6 1/2 cm

Page 7

3/10 means three divided by ten $3 \div 10 = 0.3$
5/10 means five divided by ten $5 \div 10 = 0.5$
9/10 means nine divided by ten $9 \div 10 = 0.9$
1/4 means one divided by four $1 \div 4 = 0.25$
4/10 means four divided by ten $4 \div 10 = 0.4$

Page 8

13/100 means thirteen divided by a hundred $13 \div 100 = 0.13$
1/10 means one divided by ten $1 \div 10 = 0.1$
52/100 means fifty two divided by a hundred $52 \div 100 = 0.52$
26/100 means twenty six divided by a hundred $26 \div 100 = 0.26$
11/100 means eleven divided by a hundred $11 \div 100 = 0.11$
2/10 means two divided by ten $2 \div 10 = 0.2$

Page 9

1. 7.34 2. 3.14 3. 1.75 4. 6.1 5. 3.5 6. 4.99 7. 2.07 8. 5.61

Page 10

1. 6.45 2. 4.25 3. 2.9 4. 7.01 5. 4.33 6. 5.09 7. 3.17 8. 5.63

Page 11

1. 3/10 2. 7/10 3. 17/100 4. 37/100 5. 53/100 6. 0.9
7. 0.27 8. 1.2 9. 3 10. 4.1 11. 5.2 12. 6.1

Page 12

1. 6/10 or 3/5 2. 9/10 3. 28/100 or 7/25 4. 49/100 5. 67/100 6. 0.7
7. 0.37 8. 2.3 9. 50 10. 6.6 11. 9.1 12. 2.9

Answers (Contd)

Page 13

1. £14	2. £10.48	3. £47.54	4. £33.49	5. £3.42	6. £26.97
7. £59.33	8. £113.97	9. £8.37	10. £8.34	11. £136.13	12. £58.97
13. 5.56m	14. 12.99m	15. 19.02m	16. 10.61m		

Page 14

1. £16.22	2. £11.82	3. £59.54	4. £55.77	5. £4.74	6. £87.97
7. £55.33	8. £98.41	9. £3.21	10. £77.13	11. £22.21	12. £21.64
13. 7.83m	14. 14.92m	15. 20m	16. 11.1m		

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

0.10

0.20

0.30

1/10

2/10

3/10

4/10

5/10

6/10

7/10

8/10

9/10

10/100

20/100

30/100

40/100	50/100
---------------	---------------

60/100	70/100
---------------	---------------

80/100	90/100
---------------	---------------

$\frac{3}{4}$	0.75
---------------------------------	-------------

$\frac{1}{2}$	0.5
---------------------------------	------------

$\frac{1}{4}$	0.25
---------------------------------	-------------

0.40

0.50

0.60

0.70

0.80

0.90

$1/5$

0.2

$2/5$

0.4

$3/5$

0.6