1. Put the numbers in order from smallest to greatest.

$3\frac{1}{5}$ 3.5 $1\frac{3}{5}$ 1.3

Smallest

1 mark

2. My brother weighs **27.3kg**.

I weigh $27\frac{1}{2}$ kg.

How much more than my brother do I weigh?

kg

1 mark

3. Put the numbers in order from smallest to greatest.

1.4 $4\frac{1}{4}$ 4.1 4.4

Smallest

1 mark

4. Year 6 set off on a $2\frac{3}{4}$ km woodland walk.

By lunch, they had walked **1.75km**.

How much further do they need to walk?

km

1 mark

5. Pupils know that both proper fractions and decimals fractions can be used to represent values between whole numbers. They now need to learn that the same value can be represented by both a decimal fraction and a proper fraction, and be able to recall common equivalents, beginning with unit fractions.

Unit fraction	Decimal fraction
$\frac{1}{2}$	0.5
$\frac{1}{4}$	0.25
$\frac{1}{5}$	0.2
$\frac{1}{10}$	0.1

Pupils should also be able to explain the equivalencies. A shaded hundred grid is a useful representation here.

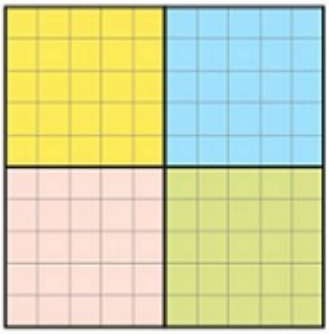
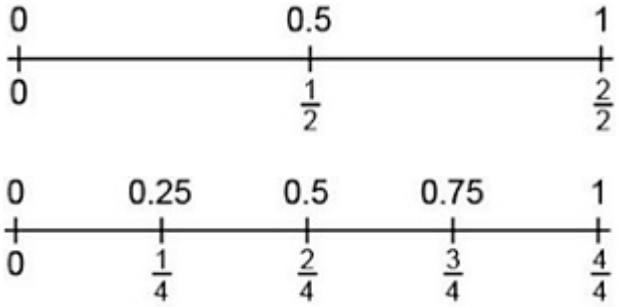


Figure 1 : hundred grid divided into 4 equal parts: $\frac{1}{4}$ is equal to 25 hundredths

$$\frac{1}{4} = \frac{25}{100} = 0.25$$

Pupils should then extend their understanding and automatic recall to multiples of these unit fractions / decimal fractions, up to 1.



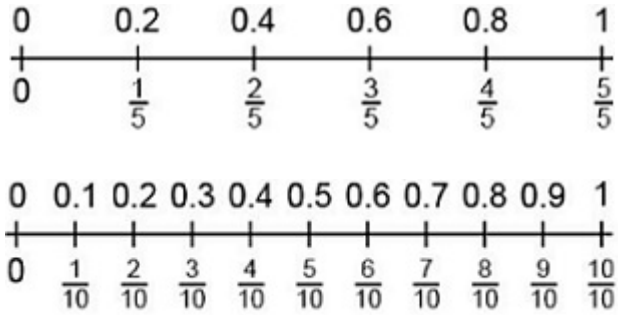


Figure 2 : 0 to 1 number lines illustrating common proper fraction – decimal fraction equivalents

Pupils must be able to use these common equivalents with little effort, applying them to solve comparison and measures problems such as those shown in the example assessment questions. For a given problem, posed using a mixture of decimal fractions and proper fractions, pupils should be able to make a sensible decision about whether to carry out the calculation using decimal fractions or proper fractions.

Finally, pupils need to extend this knowledge beyond the 0 to 1 interval. They should know for example that 3.2km and $3\frac{1}{5}$km are 2 different ways of writing the same distance.

Making connections

This criterion builds on **5NPV–4**, where pupils learnt to divide 1 into 2, 4, 5 or 10 equal parts and to read scales marked in multiples of multiples of 0.1, 0.2, 0.25 or 0.5.

Criterion **5NPV–5** requires pupils to convert between units of measure, including using the common decimal fraction and proper fraction equivalents in this criterion.

6. Write these measurements as decimals.

$\frac{1}{4}$ = ____ litres

$1\frac{1}{4}$ = ____ litres

$10\frac{1}{2}$ = ____ cm

$4\frac{4}{5}$ = ____ m

2 marks

7. Write these measurements as mixed numbers **in their simplest form**.

1.2km = ☐

5.75m = ☐

25.5kg = ☐

2 marks

8. Sally and Tahira **each** have a **1m** ribbon.

Sally cuts her ribbon into **5** equal parts and uses **1** of them to make a hair tie.

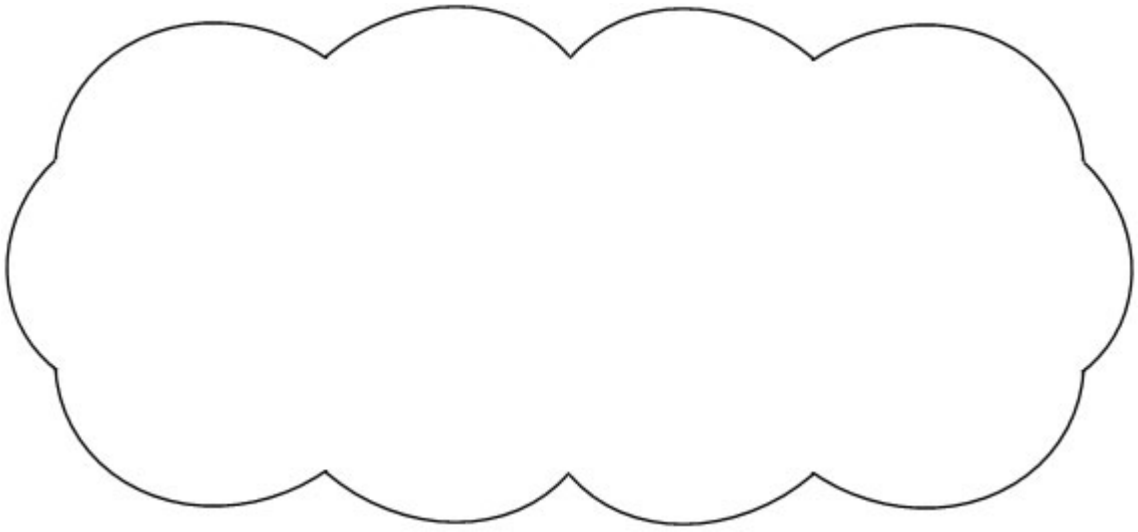
Tahira cuts her ribbon into **10** equal parts and uses **3** of them to make a bracelet.

Have Sally and Tahira used the same amount of ribbon?

Circle **Yes** or **No**.

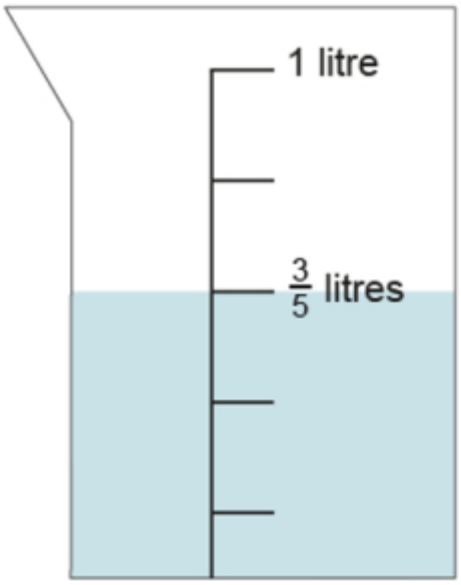
Yes / No

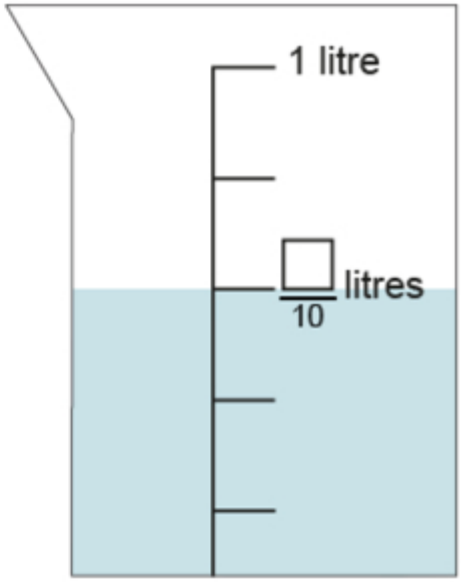
Explain your answer.



1 mark

9. Fill in the missing number.





1 mark

10. Fill in the missing number.

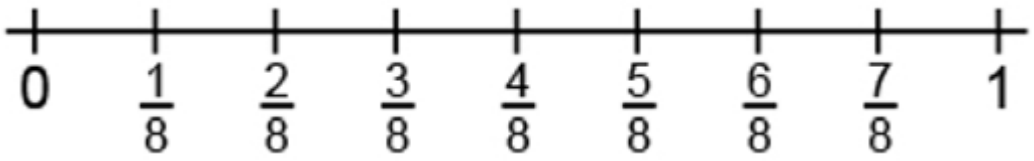
$\frac{4}{8} = \frac{12}{\square}$ $\frac{3}{5} = \frac{\square}{40}$ $\frac{3}{\square} = \frac{21}{63}$ $\frac{20}{30} = \frac{\square}{15}$

2 marks

11. Draw a line from each fraction to its correct place on the number line.

Hint: convert each fraction to an equivalent fraction with a denominator of 8.

$\frac{9}{24}$ $\frac{36}{48}$ $\frac{12}{16}$ $\frac{10}{40}$ $\frac{9}{72}$



2 marks

12. Use the numbers 3, 24, 8 and 1 to complete this chain of equivalent fractions.

$$\frac{2}{6} = \frac{\square}{\square} = \frac{\square}{\square}$$

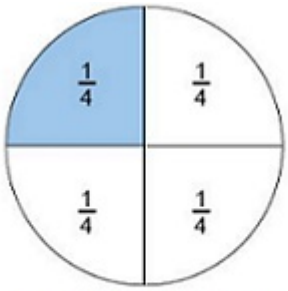
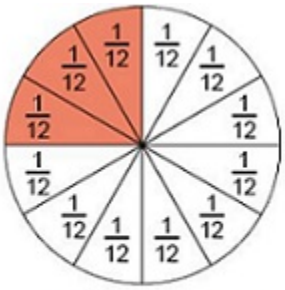
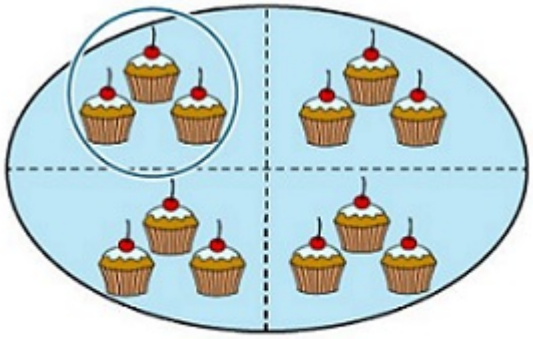
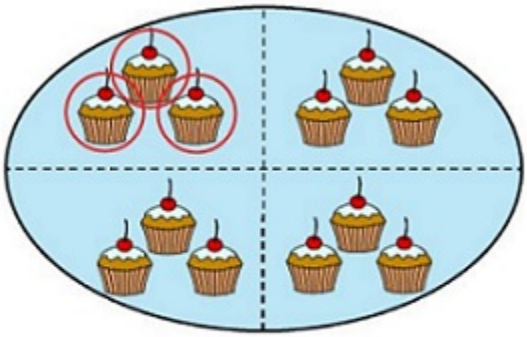
1 mark

13. Draw lines to match the unit fractions on the left with their equivalent fractions on the right.

$\frac{1}{5}$	$\frac{3}{12}$
$\frac{1}{4}$	$\frac{4}{20}$
$\frac{1}{3}$	$\frac{3}{9}$

1 mark

14. Pupils must understand that more than one fraction can describe the same portion of a quantity, shape or measure. They should begin with an example where one of the fractions is a unit fraction, and the connection to the equivalent fraction uses known multiplication table facts.

$\frac{1}{4}$	$\frac{3}{12}$
 Figure 1 : circle divided into 4 equal parts with 1 part shaded **Language focus** "The whole is divided into 4 equal parts and 1 of those parts is shaded."	 Figure 2 : circle divided into 12 equal parts with 3 parts shaded **Language focus** "The whole is divided into 12 equal parts and 3 of those parts is shaded."
 Figure 3 : diagram showing that $\frac{1}{4}$ of 12 cakes is equal to 3 cakes	 Figure 4 : diagram showing that $\frac{3}{12}$ of 12 cakes is equal to 3 cakes

$$\frac{1}{4} = \frac{3}{12}$$

Pupils should learn that 2 different fractions describing the same portion of the whole share the same position on a number line, have the same numerical value and are called equivalent fractions.

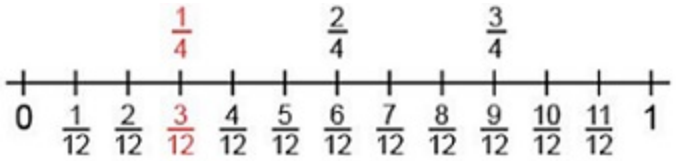


Figure 5 : number line showing that $\frac{1}{4}$ and $\frac{3}{12}$ are equivalent

Pupils need to understand that equivalent fractions, such as $\frac{1}{4}$ and $\frac{3}{12}$, have the same numerical value because the numerator and denominator within each fraction have the same proportional relationship. In each case the numerator is $\frac{1}{4}$ of the denominator (and the denominator is 4 times the numerator).

Language focus

$\frac{1}{4}$ and $\frac{3}{12}$ are equivalent because 1 is the same portion of 4 as 3 is of 12."

Attending to the relationship between the numerator and denominator will prepare pupils for comparing fractions with different denominators in year 6 (**6F–3**). Pupils should also be able to identify the multiplicative relationship between the pair of numerators, and understand that it is the same as that between the pair of denominators.

Pupils should learn to find equivalent fractions of unit fractions by using one of these multiplicative relationships (the 'vertical' relationship between the numerator and denominator, or the 'horizontal' relationship between the pairs of numerators and denominators).

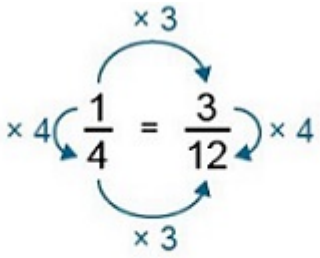


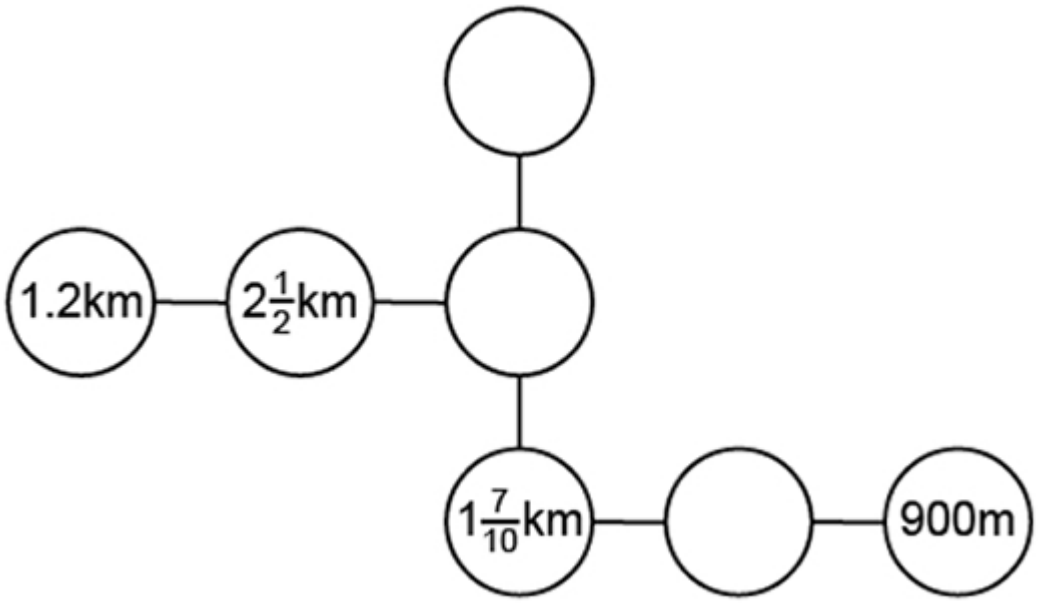
Figure 6 : diagram showing the multiplicative relationships between the numerators and denominators in $\frac{1}{4}$ and $\frac{3}{12}$

In a similar way, pupils must then learn to find equivalent fractions of non-unit fractions, for example, $\frac{3}{5} = \frac{6}{10}$ or $\frac{3}{12} = \frac{8}{32}$.

Making connections

Pupils must be fluent in multiplication facts within the multiplication tables, and corresponding division facts (**5NF–1**). Being able to find unit and non-unit fractions of a quantity (**5F–1**) helps pupils to see that equivalent fractions have the same value.

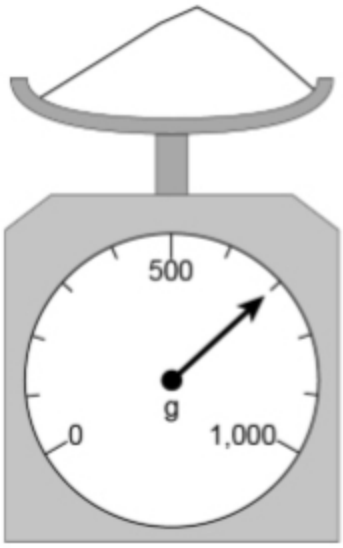
15. Fill in the values in the empty circles so that each row and column of 3 circles adds to **5km**.



2 marks

16. I need $1\frac{1}{4}$**kg** of flour for a recipe.

I pour some flour into the weighing scales.



How much more flour do I need for the recipe?

Show your method

kg

2 marks

17. Match the numbers on the left with the equivalent fractions on the right.

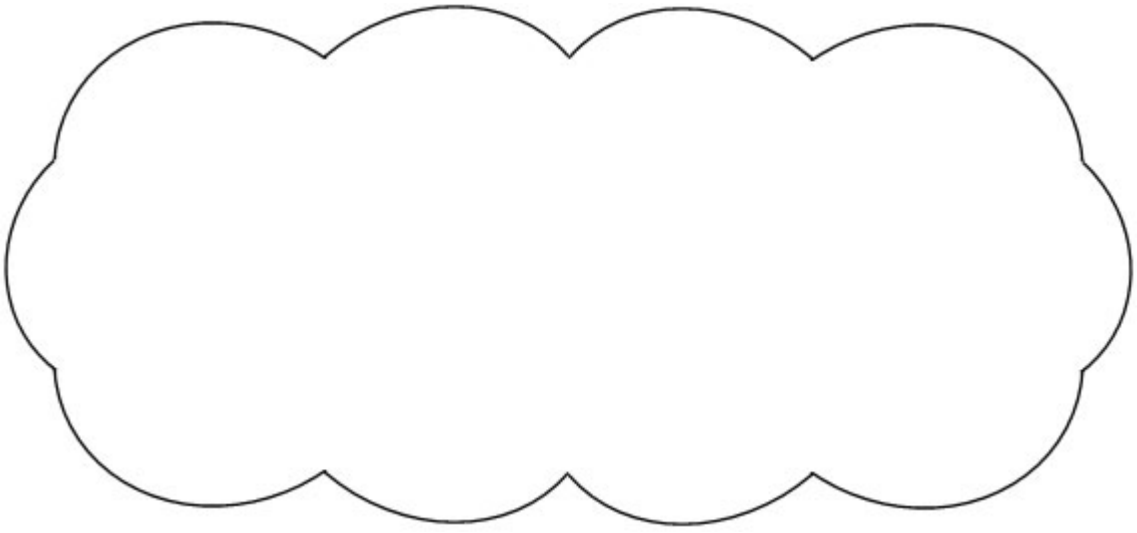
0.20	$\frac{2}{100}$
0.02	$\frac{21}{100}$
0.12	$\frac{2}{10}$
0.21	$\frac{12}{100}$

1 mark

18. Circle fractions that are equivalent to a whole number.

$\frac{48}{6}$ $\frac{48}{7}$ $\frac{48}{8}$ $\frac{48}{9}$ $\frac{48}{10}$

Explain how you know.

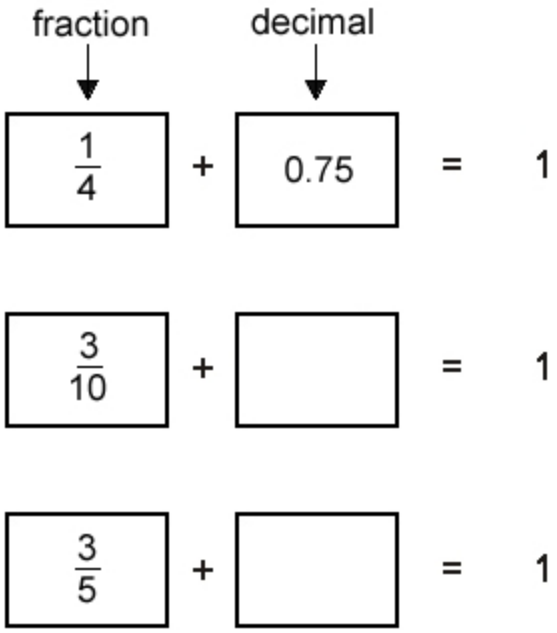


2 marks

19. **Fractions and decimals**

(a) Write the missing **decimal** so that each pair **adds to 1**

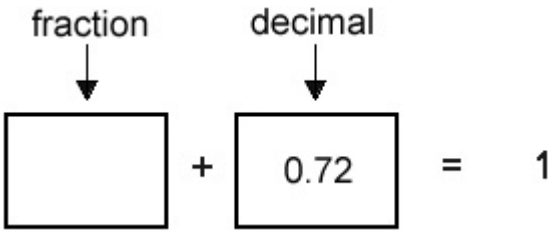
The first one is done for you.

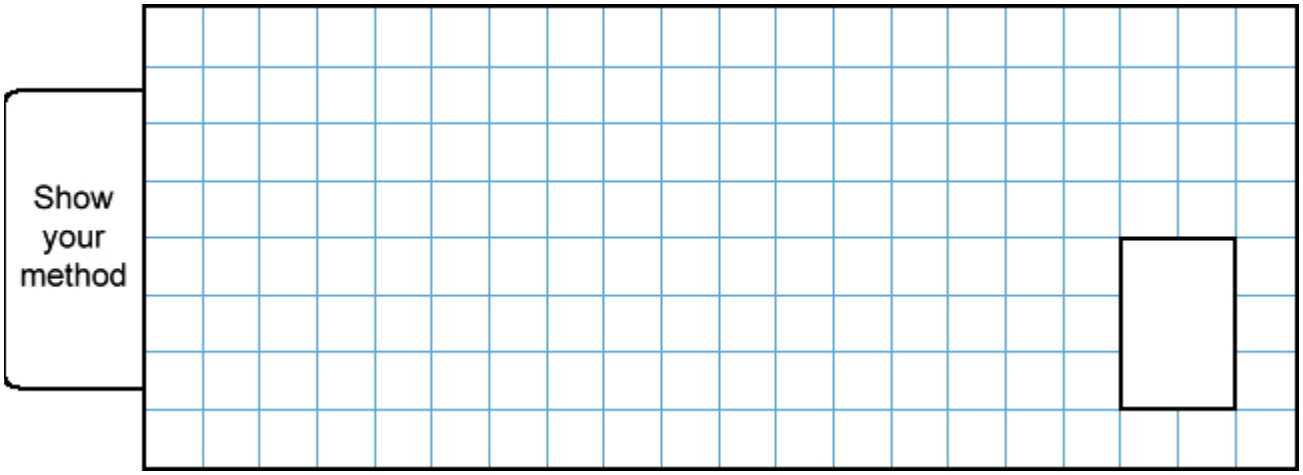


2 marks

(b) Write the missing **fraction** so that the pair below **adds to 1**

Write the fraction as simply as possible.





2 marks

20. **Equivalence**

Some of the statements below are correct.

Tick (✓) the correct ones.

	Tick (✓) if correct
$\frac{1}{2} = 0.5$	
$\frac{9}{30} = \frac{3}{10}$	
$0.75 = \frac{3}{4}$	
$\frac{1}{10}$ is equivalent to 10%	
$\frac{1}{5}$ is equivalent to 5%	

2 marks

21. **Quiz**

In a quiz, Ravi answered **24** out of **40** questions correctly.

What **percentage** of the questions did he answer correctly?

%

1 mark

22. **High jump**

Dave and Steve are in a high jump competition.

Dave jumps $1\frac{1}{4}$ metres.

Steve jumps **1.4** metres.

Who jumps higher? Tick (✓) Dave or Steve.

☐ Dave ☐ Steve

How much higher does he jump?

Give your answer in metres.

Show your method

metres

2 marks

23. **Sixteenths**

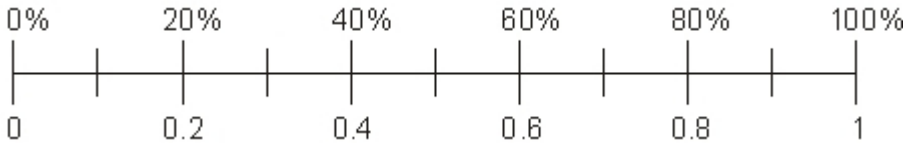
$\frac{15}{16}$ as a decimal is **0.9375**

What is $\frac{31}{16}$ as a decimal?

1 mark

24. **Double scale**

The scale shows both percentages and decimals.



Fill in the missing **decimals** in the gaps below.

The first one is done for you.

60% is the same as ___*0.6*___

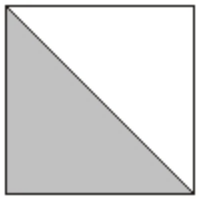
30% is the same as _____

1 mark

3% is the same as _____

1 mark

25. (a) **Half** of this square is shaded.

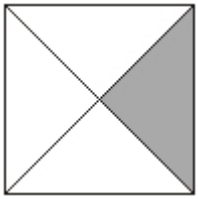


What **percentage** of the square is shaded?

%

1 mark

(b) What **percentage** of this square is shaded?

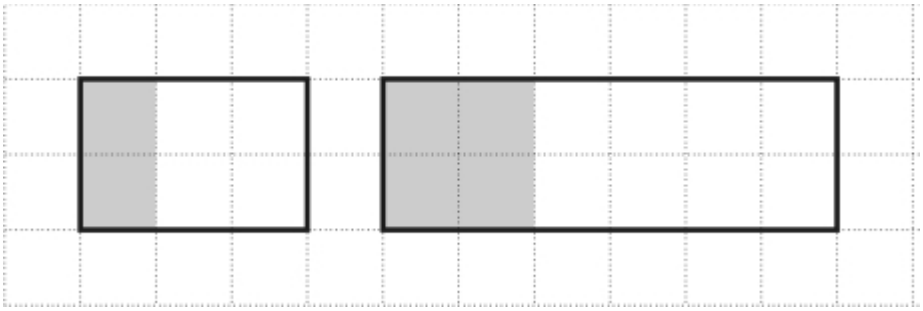


%

1 mark

26. **Rectangles**

Look at the rectangles on the square grid.



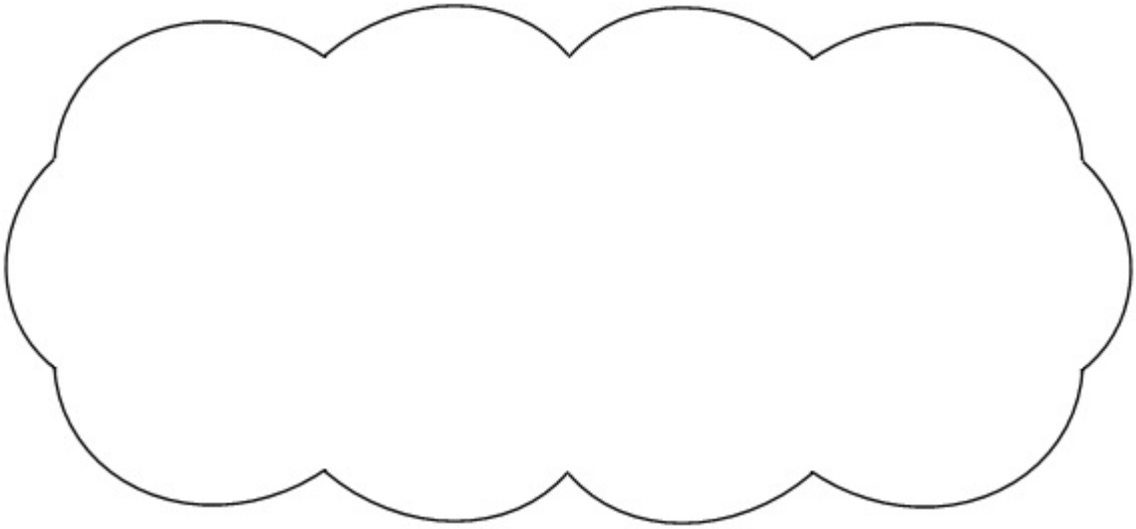
Jan says:

The **same fraction** of each rectangle is shaded.

Is Jan correct? Tick (✓) Yes or No.

Yes ☐ No ☐

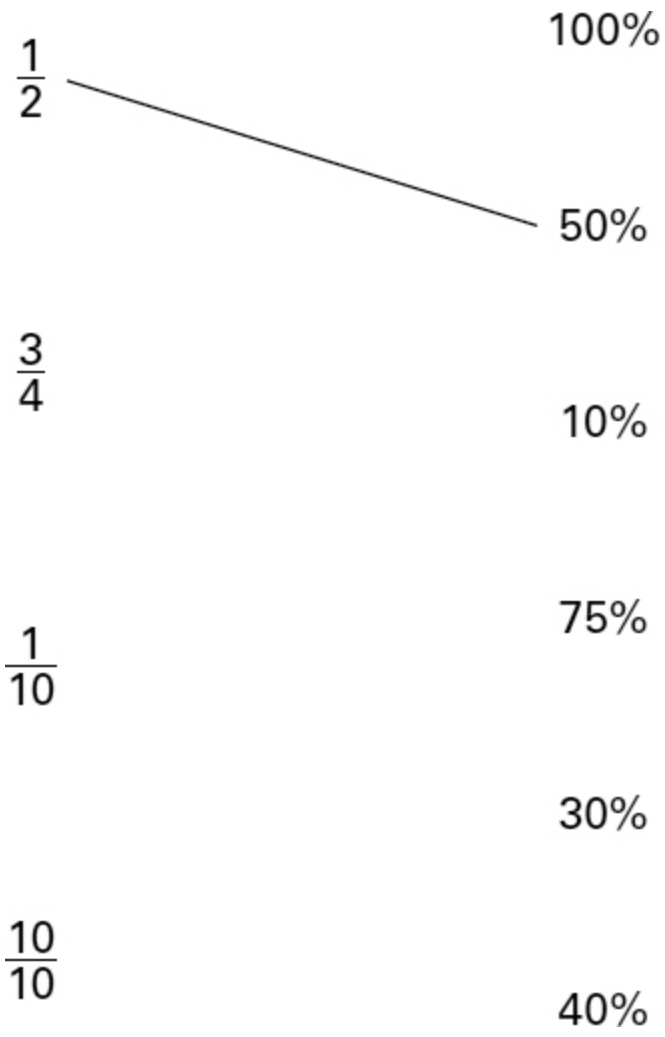
Explain your answer.



1 mark

27. Match each fraction to the percentage which has the same value.

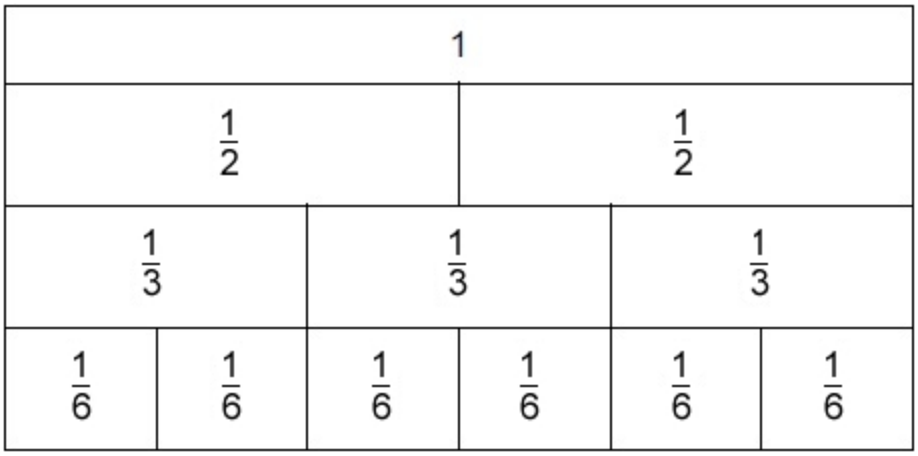
One has been done for you.



1 mark

28. **Fraction wall**

Look at the fraction diagram.



Write the missing numbers in the boxes below.

$$\boxed{1} = \frac{\square}{\boxed{6}}$$

1 mark

$$\frac{\boxed{1}}{\boxed{2}} = \frac{\square}{\boxed{6}}$$

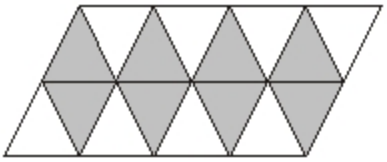
1 mark

$$\frac{\square}{\boxed{3}} = \frac{\boxed{4}}{\boxed{6}}$$

1 mark

29. **Finding fractions**

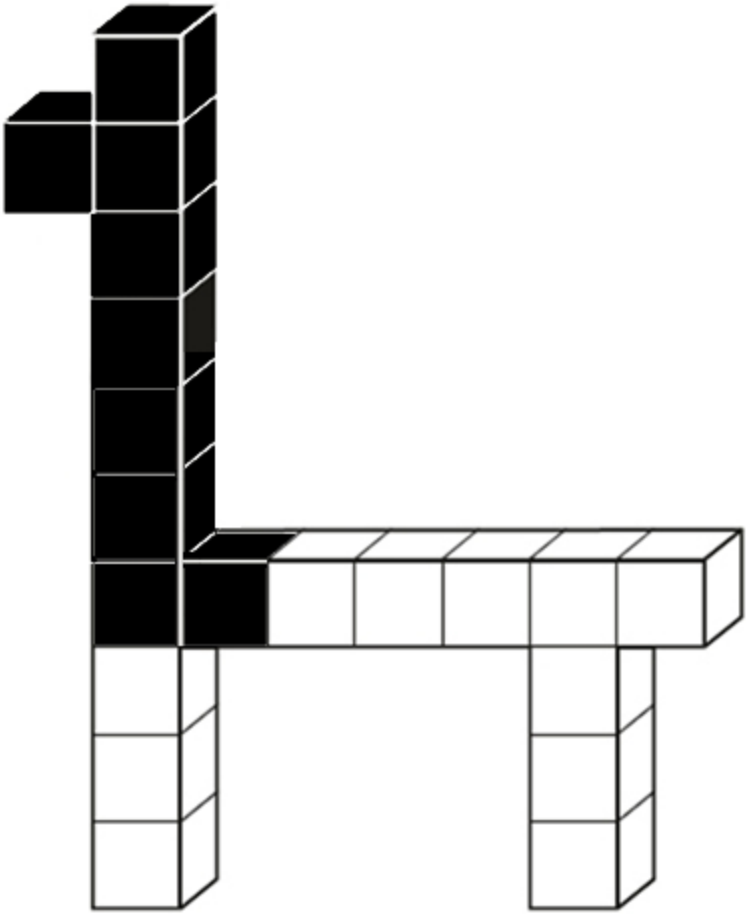
Look at the shape.



What **fraction** of the shape is shaded?

1 mark

30. This model is made with 20 cubes.



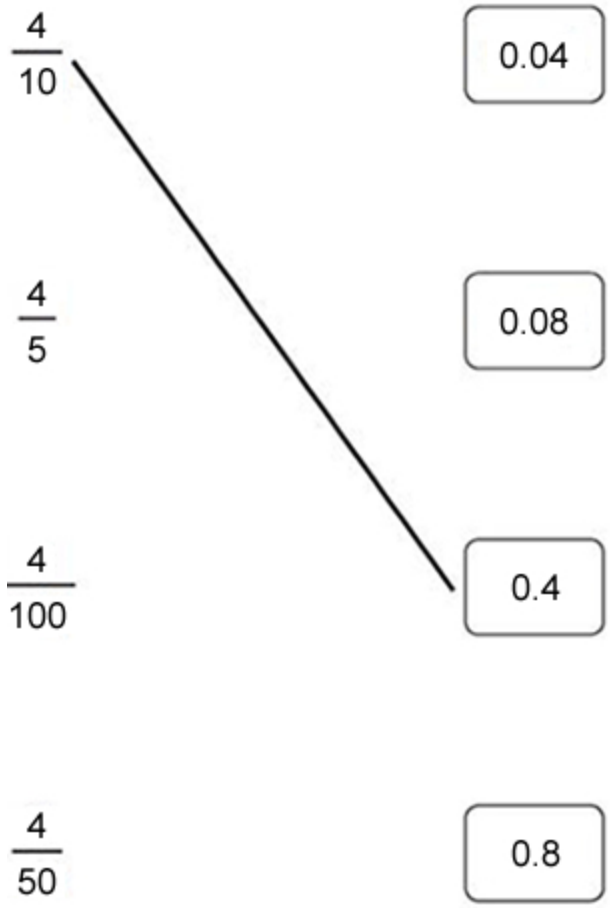
What **percentage** of the cubes in the model is black?

%

1 mark

31. Join each fraction to the correct decimal card.

The first one has been done for you.



1 mark

32. Look at these fractions.

$\frac{2}{4}$ $\frac{1}{3}$ $\frac{3}{5}$ $\frac{2}{6}$

Circle the **two** fractions that are **equal**.

1 mark

33. In each box, circle the number that is **greater**.

$1\frac{3}{4}$	1.5
$1\frac{1}{3}$	1.7
$1\frac{8}{100}$	1.8
$1\frac{1}{2}$	1.3

2 marks

34. Fill in the missing symbols (<, > or =).

$\frac{1}{10}$ ☐ 0.75 0.4 ☐ $\frac{1}{4}$

0.5 ☐ $\frac{1}{5}$ $\frac{3}{4}$ ☐ 0.75

0.8 ☐ $\frac{4}{5}$ $\frac{1}{2}$ ☐ 0.2

2 marks

Mark schemes

1. Fractions and decimals written in the correct order, as shown:

1.3, $1\frac{3}{5}$, $3\frac{1}{5}$, 3.5

Accept the fraction / decimal joined to the correct box, rather than written in it. Accept equivalent decimals or fractions.

***Do not** accept transcription errors or misreads for this question.*

[1]

2. 0.2 kg

[1]

3. Fractions and decimals written in the correct order, as shown:

1.4, 4.1, $4\frac{1}{4}$, 4.4

Accept the fraction / decimal joined to the correct box, rather than written in it. Accept equivalent decimals or fractions.

***Do not** accept transcription errors or misreads for this question.*

[1]

4. 1 km

[1]

6. Award **TWO** marks for all three correct answers, as shown:

$1\frac{1}{4}$ litres = 1.25 litres

$10\frac{1}{2}$ cm = 10.5 cm

$4\frac{4}{5}$ m = 4.8 m

If incorrect, award **ONE** mark for 2 correct responses.

Up to 2m

[2]

7. Award **TWO** marks for all three correct answers, as shown:

1.2 km = $1\frac{1}{5}$ km

5.75 km = $5\frac{3}{4}$ km

25.5 kg = $25\frac{1}{2}$ kg

If incorrect, award **ONE** mark for 2 correct responses (simplified) **OR** all correct but not simplified.

Up to 2m

[2]

8. Aware **ONE** mark for a correct explanation of why Sally and Tahira have **NOT** used the same amount of ribbon, e.g.

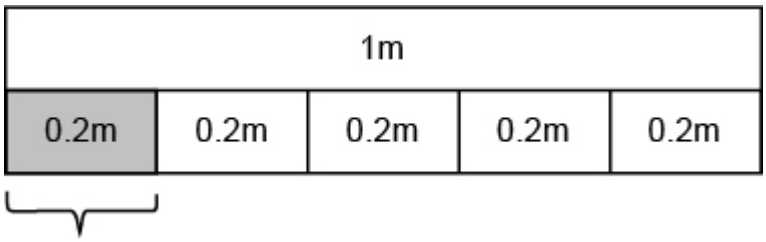
- One fifth of 1m is 0.2 m and one tenth of 1m is 0.1. As Tahira has used 3/10 she has used 0.3m which is greater than 0.2.

Do not *accept vague or incomplete explanations, e.g.*

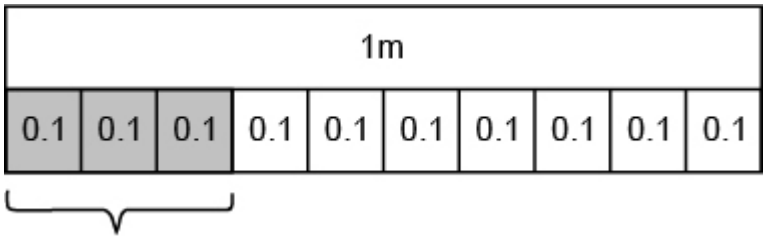
- *Tahira has used more because she has used 3 parts but Sally has only used one part.*

Bar models might be a helpful representation to use.

Sally



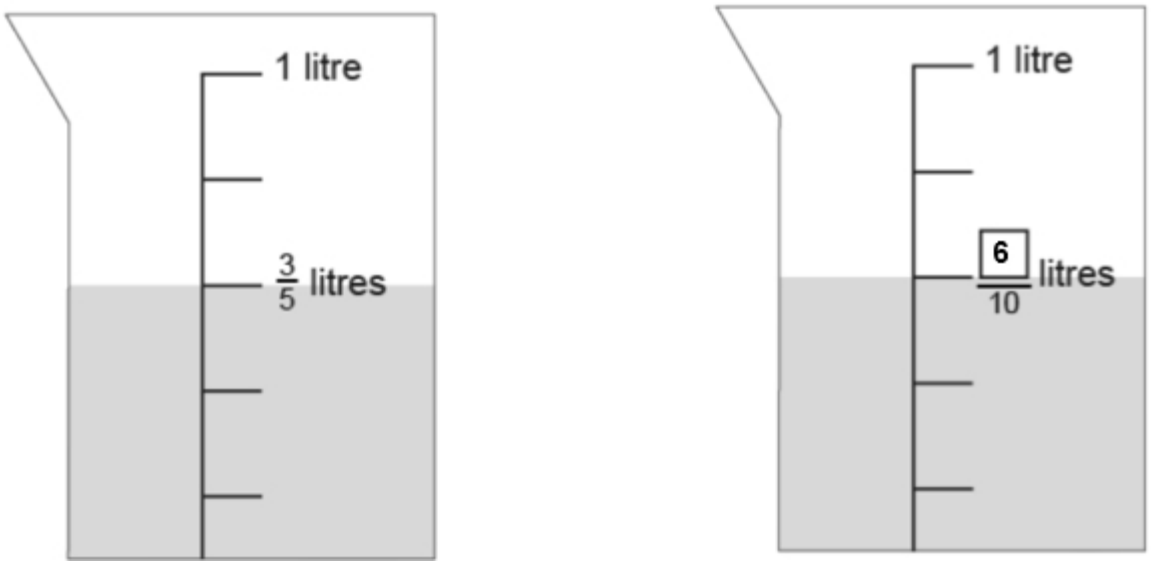
Tahira



If incorrect, award **ONE** mark for any three correct.

[1]

9.



[1]

10. Award **TWO** marks for all four correct, as shown:

$\frac{4}{8} = \frac{12}{\boxed{24}}$ $\quad \frac{3}{5} = \frac{\boxed{24}}{40}$ $\quad \frac{\boxed{3}}{9} = \frac{21}{63}$ $\quad \frac{20}{30} = \frac{\boxed{10}}{15}$

If incorrect, award **ONE** mark for any three correct.

Up to 2m

[2]

11. Award **TWO** marks for all five fractions to be correctly positioned on the number line as shown:

If incorrect, award **ONE** mark for four fractions correctly positioned.

Up to 2m

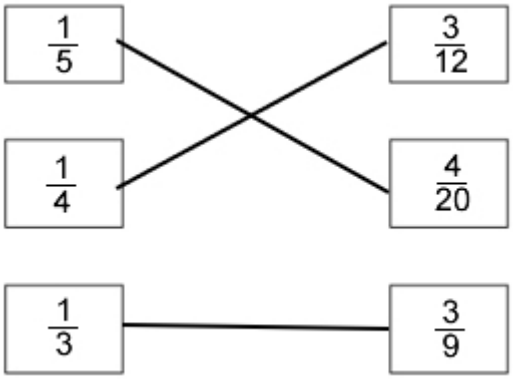
[2]

12. Award **ONE** mark for all four numbers correctly positioned as shown:

$\frac{2}{6} = \frac{\boxed{1}}{\boxed{3}} = \frac{\boxed{8}}{\boxed{24}}$

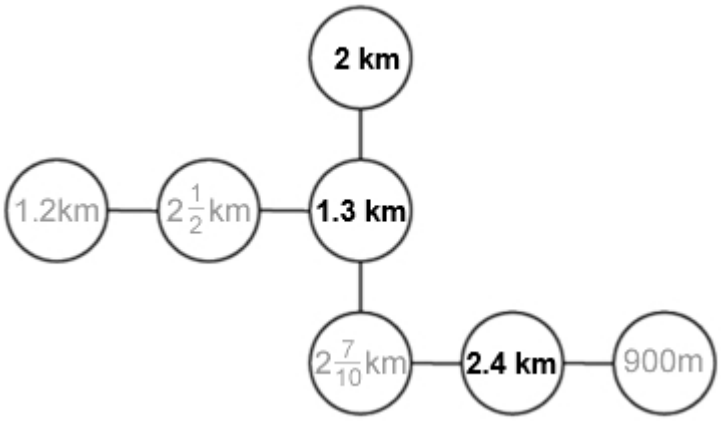
[1]

13. Award **ONE** mark for the three fractions matched correctly as shown:



[1]

15. Award **TWO** marks if all three sides add up to 5km. (REFER TO WORD DOC)



Numbers need not be written inside circles, as long as their intended positions are clearly indicated.

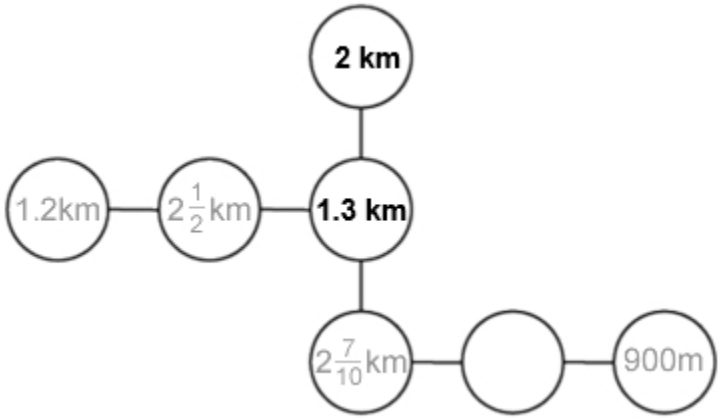
Accept answers written as equivalent number of fractions,
e.g.

- *1.3km = 1 $\frac{3}{10}$ km*
- 2 $\frac{2}{5}$ or 2 $\frac{4}{10}$ km instead of 2.4 km

Award **ONE** mark if only one side adds up to 5km.

*For the award of one mark **three acceptable numbers** must be in a line which adds to 5km, but not all four numbers need be used, e.g*

accept



Up to 2m

[2]

16. Award **TWO** marks for the correct answer of 550 g.

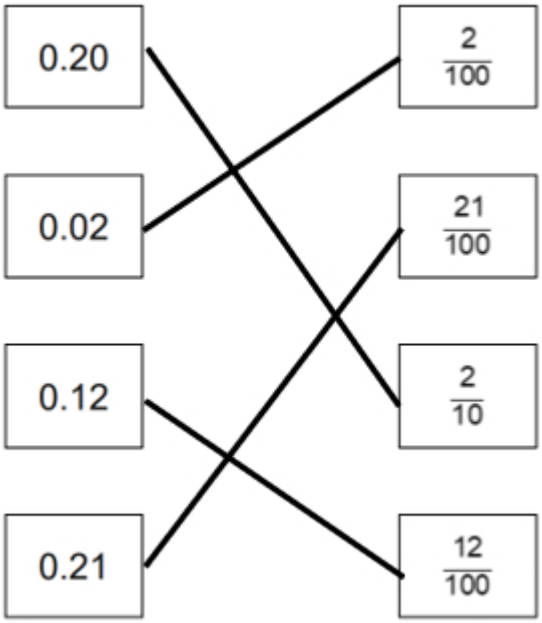
If the answer is incorrect, award **ONE** mark for evidence of an appropriate method, e.g.

- 1250 g − 700 g = 450 g *(error)*
- 1.25 kg − 0.7 kg = 1.18 kg *(error)*
- 700g + **450** = 1250 g *(error)*

Up to 2m

[1]

17. Award **ONE** mark for the four fractions matched correctly to decimals, as shown:



[1]

18. (a) $\frac{48}{6}$ $\frac{48}{7}$ $\frac{48}{8}$ $\frac{48}{9}$ $\frac{48}{10}$

If other fractions are circled incorrectly but a correct unambiguous explanation is given, then award the mark.

1m

(b) An explanation recognising that both 6 and 8 are factors of 48, e.g.

- '6 and 8 are both factors of 48'
- '48 is a multiple of 6 and 8 and thus will make a whole number'
- '48/6 = 8 wholes and 48/8 = 6 wholes'

No mark awarded for circling correct fractions without explanation.
***Do not** accept vague or incomplete explanations, eg.*

- '$\frac{48}{6}$ and $\frac{48}{8}$ are both equivalent to a whole'

1m

[2]

19. (a) 0.7 or equivalent decimal
Do not accept equivalent fractions

1

0.4 or equivalent decimal

1

(b) $\frac{7}{25}$
Do not accept equivalent decimals

2

or Show the fraction $\frac{28}{100}$ or equivalent fraction, even if there is incorrect further processing

! For 1m, incorrect notation, eg

- $\frac{2.8}{10}$

Do not accept unless a correct fraction is also shown

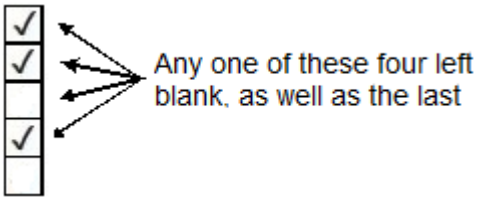
1

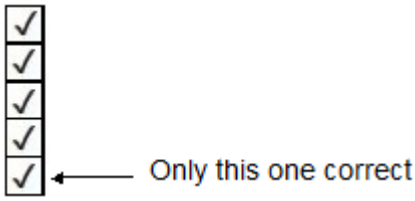
[4]

20. All four correct statements identified, ie

2

or Not more than one error, eg





Accept unambiguous notation, eg

1

[2]

21. 60

1

[1]

22. Indicates Steve and gives the value 0.15 or equivalent

2

or Shows the value 0.15 or equivalent

or

Indicates Steve and shows the digits 15

or

Indicates Steve and shows either the value 1.25 or equivalent decimal or the value 125

or

Indicates Steve and converts both heights to mixed numbers or fractions, where the fractions have a common denominator, eg

- $1\frac{10}{40}, 1\frac{16}{40}$

1

[2]

23. 1.9375 or equivalent decimal

U1

[1]

24. 0.3
Accept equivalent decimals
eg, for the first mark
- *0.30*

1

0.03
! Follow through
Accept follow through as their first mark ÷ 10, provided their first mark was a decimal between 0 and 1 exclusive

1

[2]

25. (a) 50

Do not accept equivalent fractions or decimals

1

(b) 25

Do not accept follow through

1

[2]

26. Indicates Yes and gives a correct explanation

The most common correct explanations:

Show that the fraction is $\frac{1}{3}$ for both rectangles, eg

- First rectangle has 6 squares, $\frac{1}{3}$ of 6 = 2
- Second rectangle has 12 squares, $\frac{1}{3}$ of 12 = 4
- 2 is a third of 6, 4 is a third of 12
- 6 ÷ 3 = 2 and 12 ÷ 3 = 4

Accept minimally acceptable explanation, eg

- $\frac{1}{3}$
- *Both divided by 3*

Use equivalent fractions, eg

- $\frac{2}{6}=\frac{4}{12}$
- $\frac{1}{3}=\frac{2}{6}$

Accept minimally acceptable explanation, eg

- *One is 2 out of 6 and the other is 4 out of 12*

Reason spatially, eg

- The 2nd rectangle is twice the area of the 1st, so twice as much should be shaded and it is
- Double 6 is 12, double 2 is 4

Accept minimally acceptable explanation, eg

- *Three shaded bits fit in each rectangle*
- *You can get two more shaded bits in each*

! Incorrect description of units of area

Condone

eg, accept

- *First is one square out of 3, second is two squares out of 6*

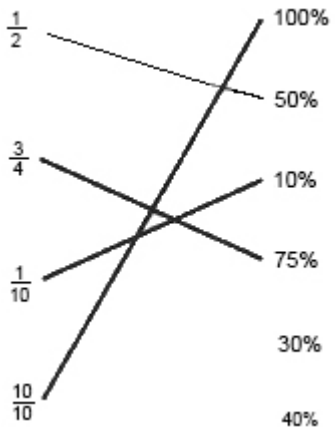
Do not accept incomplete explanation, eg

- *In the first there are 2 shaded and in the second there are 4 shaded*
- *The second rectangle is twice the area of the first*
- *The bigger one has twice as much shaded*
- *The second is double the first*
- *The same proportion is shaded in each*

U1

[1]

27. All three fractions matched as shown:



All three *lines must be drawn correctly for the award of the mark.*

Lines need not touch the numbers provided the intention is clear.

Do not *accept fractions which have been matched to more than one percentage.*

[1]

28. Gives the correct numerator, ie

$$\frac{6}{6}$$

1

Gives the correct numerator, ie

$$\frac{3}{6}$$

1

Gives the correct numerator, ie

$$\frac{2}{3}$$

1

[3]

29. $\frac{1}{2}$ or equivalent fraction

Accept equivalent fractions and decimals e.g

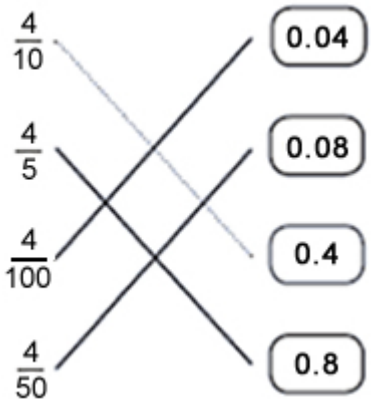
$\frac{8}{16}$, 0.5

[1]

30. 45%

[1]

31. Fractions connected correctly to decimals as shown:



[1]

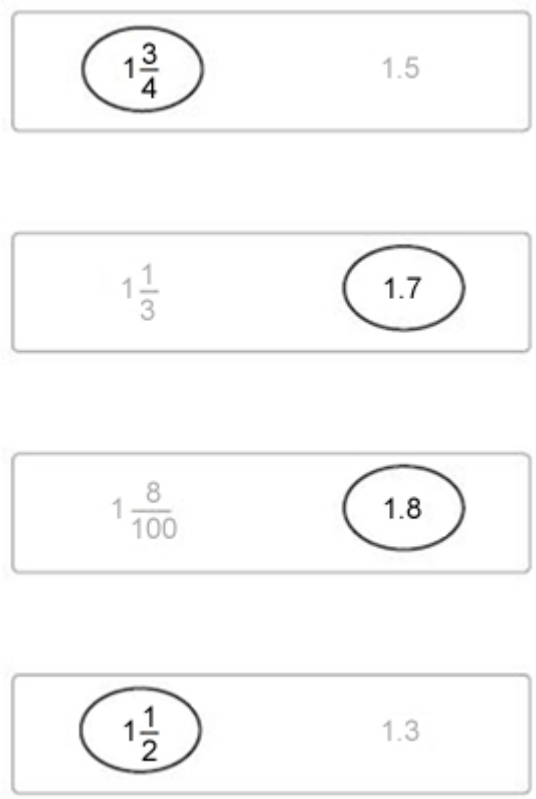
32. Both fractions circled as shown:

$\frac{2}{4}$ $\left(\frac{1}{3}\right)$ $\frac{3}{5}$ $\left(\frac{2}{6}\right)$

Accept any other clear way of indicating the correct fractions.
***Do not** award the mark if other fractions are indicated unless it is clear that the correct two fractions are the pupil's final choice.*

[1]

33. Award **TWO** marks for all four rows completed correctly as shown:



If the answer is incorrect, award **ONE** mark for three rows completed correctly.
Accept alternative unambiguous positive indications of the correct numbers, e.g numbers ticked.

Up to 2m

[2]

34. Award **TWO** marks for all correct, as shown:

If incorrect, award **ONE** mark for any four or five correct.

Up to 2m

[2]