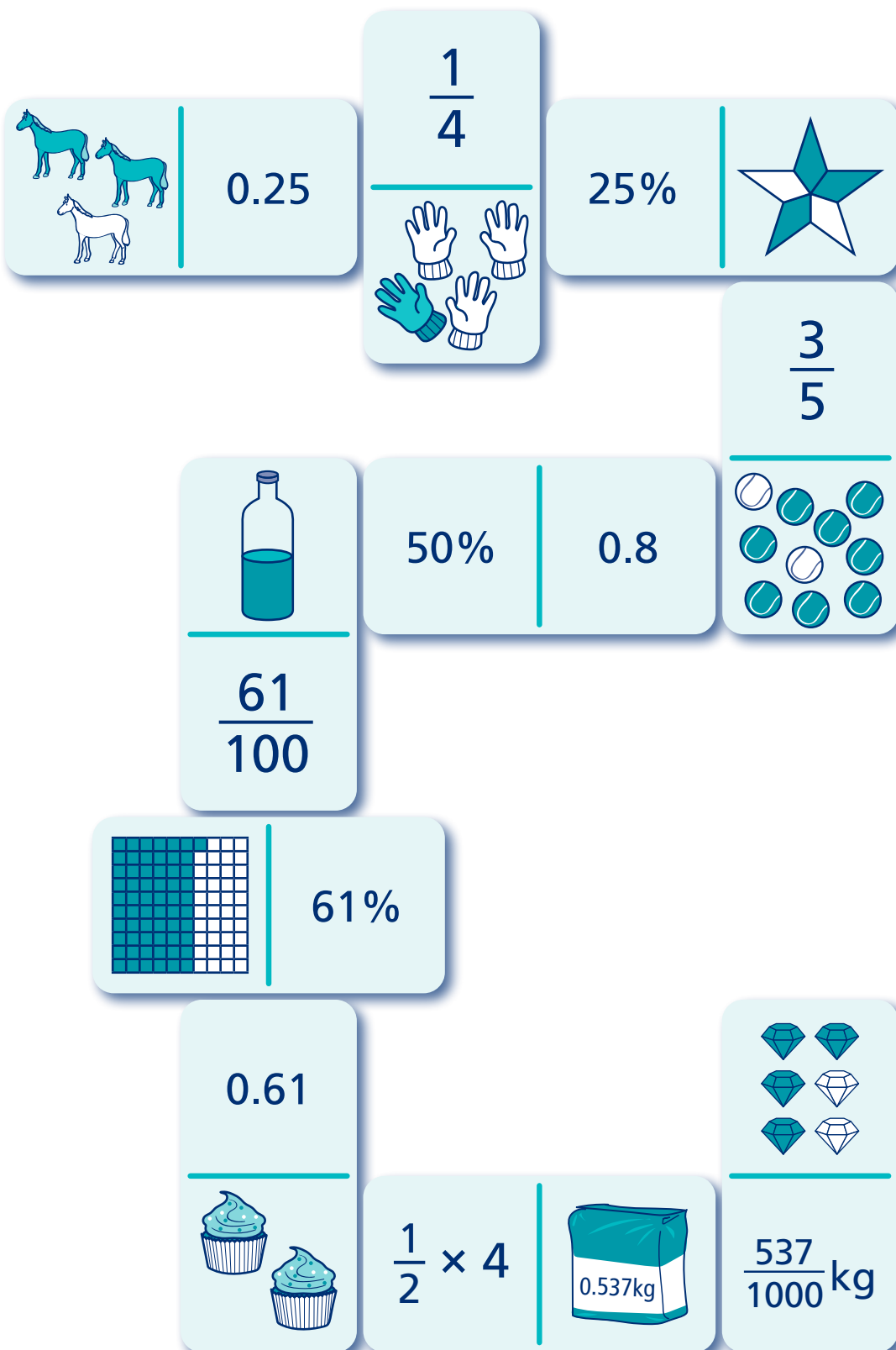


Fractions 5

Answers



Name _____

Find equivalent fractions represented visually

Key point

Fractions that stand for the same amount are **equivalent**.



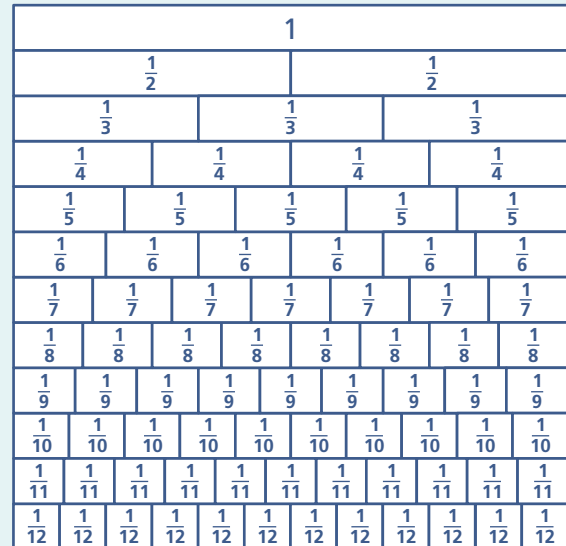
$\frac{3}{4}$ is equivalent to $\frac{6}{8}$.



$\frac{2}{3}$ is equivalent to $\frac{6}{9}$.



Use the fraction wall to find equivalent fractions and answer the questions.



Get started

- 1 Tick the shape that shows a fraction equivalent to one-half.


☐

☐

☒

- 2 How many sixths are equivalent to $\frac{2}{3}$?
4 sixths



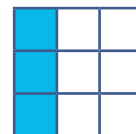
- 3 How many lots of $\frac{1}{12}$ are equivalent to one-half? 6



- 4 $\frac{1}{4}$ is equivalent to $\frac{3}{12}$.

- 5 The fraction $\frac{6}{10}$ is equivalent to how many fifths? 3 fifths

- 6 Colour one-third of this shape.



- 7 True or false? $\frac{3}{4} = \frac{6}{10}$ True ☐ False ☒

- 8 $\frac{6}{8} = \frac{9}{12}$

Now try these

- 9 Write the fraction of each shape that is turquoise. Write a fraction with a different denominator each time.



- 10 A bar of chocolate has 10 chunks. Callum eats four-fifths of the whole bar.
 How many chunks does he eat? 8

- 11 A mango is cut into 12 equal pieces. Amy eats $\frac{5}{6}$ of the mango. How many pieces does she eat? 10

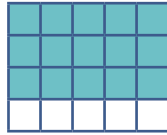
- 12** 6 out of 30 gems are turquoise. Joe says that one-fifth of the gems are turquoise. Is he correct? Yes ☒ No ☐



- 13** True or false? $\frac{7}{10} = \frac{3}{4}$ True ☐ False ☒

- 14** Is $\frac{7}{9}$ greater than, less than or equivalent to $\frac{2}{3}$? greater than

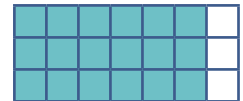
15 $\frac{15}{20} = \frac{3}{4}$



- 16** How many hundredths is equivalent to one-quarter? 25 hundredths

17 $\frac{4}{5} = \frac{8}{10} = \frac{80}{100}$

- 18** This grid is made from 21 squares. Sophie colours 18 squares. She says that $\frac{18}{21}$ is equivalent to a number of sevenths. How many sevenths? 6 sevenths



Challenge

- 19** Fill the gaps with the numbers 2, 8 and 12 to create two equivalent fractions.

$\frac{2}{8} = \frac{3}{12}$

- 20** Max has 100 marbles. $\frac{25}{100}$ are plain and $\frac{1}{4}$ have swirls. Does he have more, fewer or the same number of plain marbles as those with swirls? the same number



- 21** True or false? These mixed numbers are equivalent: $1\frac{1}{5} = 1\frac{2}{10}$ True ☒ False ☐

- 22** Circle all the fractions that are equivalent to $\frac{8}{12}$. $\frac{3}{4}$ $\frac{2}{3}$ $\frac{4}{6}$ $\frac{2}{5}$ $\frac{6}{9}$ $\frac{6}{8}$

- 23** A lorry driver stops for a break after $\frac{6}{10}$ of his journey. If his journey is 100 kilometres, after how many kilometres does he stop? 60 km



- 24** In a sports team $\frac{10}{12}$ are girls. Is it possible to group the team into three equal groups with two groups that are all girls and one group that is all boys? Yes ☐ No ☒

- 25** Is it possible to replace the question marks in this statement with odd numbers so that it is true? $\frac{?}{10}$ is equivalent to $\frac{?}{5}$. Yes ☐ No ☒

- 26** Daisy notices that $\frac{3}{10}$ of some counters are yellow. If there are 30 yellow counters, how many counters are there in total? 100

- 27** There are 50 children at a party. They play a game in which they split into five equal groups. Every child in three of the groups wins a prize, so that $\frac{3}{5}$ of the children have a prize. How many prizes are given out? 30



- 28** Gita knows that 0.6 is $\frac{6}{10}$ and that 0.60 is $\frac{60}{100}$. Is it true that 0.6 is equivalent to 0.60? Yes ☒ No ☐

Find equivalent fractions using patterns

Key point

Fractions with the same value are **equivalent**.

If you multiply or divide both the numerator and denominator of a fraction by the same number, you will get an equivalent fraction.

$$\frac{9}{12} = \frac{3}{4}$$

÷3 (top arrow), ÷3 (bottom arrow)

$$\frac{3}{7} = \frac{15}{35}$$

×5 (top arrow), ×5 (bottom arrow)

$$\frac{100}{300} = \frac{1}{3}$$

÷100 (top arrow), ÷100 (bottom arrow)

$$\frac{5}{8} = \frac{60}{96}$$

×12 (top arrow), ×12 (bottom arrow)

Get started

- 1 Circle the fraction that is equivalent to $\frac{1}{2}$.

$\frac{1}{10}$ $\frac{2}{10}$ $\frac{3}{10}$ $\frac{4}{10}$ $\frac{5}{10}$

- 2 What is the missing equivalent fraction?

$$\frac{3}{4} = \frac{15}{20}$$

×5 (top arrow), ×5 (bottom arrow)

- 3 Find the equivalent fraction.

$$\frac{7}{9} = \frac{14}{18}$$

×2 (top arrow), ×2 (bottom arrow)

- 4 True or false? $\frac{2}{5} = \frac{4}{10}$

True ☒ False ☐

- 5 The numerator and denominator of $\frac{4}{5}$ are both multiplied by 4 to give what fraction?



$$\frac{16}{20}$$

- 6 The numerator and denominator of $\frac{44}{80}$ are both divided by 4 to give what fraction?

$$\frac{11}{20}$$

- 7 Multiply both numbers of the fraction $\frac{5}{6}$ by 7 to give an equivalent fraction.

$$\frac{35}{42}$$

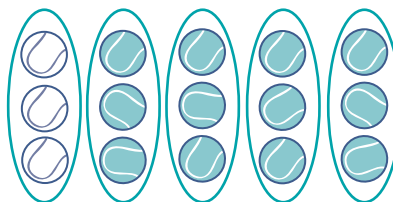
- 8 How many tenths are equivalent to three-fifths? $\frac{3}{5} = \frac{6}{10}$

Now try these

- 9 What is the missing number? $\frac{5}{7}$ is equivalent to $\frac{50}{70}$.

- 10 12 of these 15 tennis balls are turquoise. The balls are grouped into fifths.

How many fifths are turquoise? $\frac{12}{15} = \frac{4}{5}$



- 11 True or false? These three fractions are equivalent. $\frac{6}{8} = \frac{3}{4} = \frac{9}{12}$ True ☒ False ☐

- 12 Complete this pattern. $\frac{2}{3} = \frac{4}{6} = \frac{8}{12}$

13 Jack says that $\frac{36}{45}$ is equivalent to $\frac{4}{9}$. Is he correct? Yes ☐ No ☒

14 Complete this pattern. $\frac{3}{12} = \frac{1}{4} = \frac{4}{16}$

15 Amber says that $\frac{8}{10}$ and $\frac{12}{15}$ are not equivalent. Is she correct? Yes ☐ No ☒

16 Write a fraction equivalent to $\frac{32}{56}$ with the denominator 7. $\frac{4}{7}$

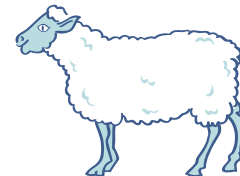
17 Circle the fraction that is not equivalent to the others in this list. $\frac{2}{5}$ $\frac{4}{10}$ $\frac{6}{15}$ $\frac{8}{20}$ $\frac{10}{30}$

18 Write a fraction equivalent to $\frac{1}{3}$ with the denominator 27. $\frac{9}{27}$

Challenge

19 In a room, $\frac{7}{8}$ of the people are male. If there are 32 people, how many of them are male? 28

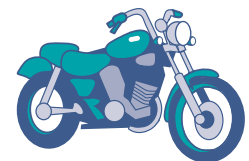
20 In a field, $\frac{4}{5}$ of the animals are sheep.
If there are 25 animals, how many of them are sheep? 20



21 There are 56 questions in a test. Dhruv answers $\frac{7}{8}$ of them correctly.
How many questions is this? 49

22 A grid of 24 squares has 18 coloured red. What proportion of the squares are red? Give your answer as a fraction with the numerator 3. $\frac{3}{4}$

23 A motorcyclist stops after $\frac{3}{5}$ of her journey for a break. If her journey is 100 kilometres, after how many kilometres does she stop? 60 km



24 Fatima knows that 0.45 is $\frac{45}{100}$. How many twentieths is 0.45 equivalent to?

$$0.45 = \frac{45}{100} = \frac{9}{20}$$

25 In a badminton tournament three teams each play the same number of matches.
Team A wins $\frac{3}{8}$ of its matches, team B wins $\frac{2}{16}$ and team C wins $\frac{1}{4}$.
Which team wins most matches? Team A



26 When the numerator and denominator are divided by the same number it is called simplifying.
Simplify the fraction $\frac{33}{44}$.
 $\frac{3}{4}$

27 Simplify $\frac{28}{35}$. $\frac{4}{5}$

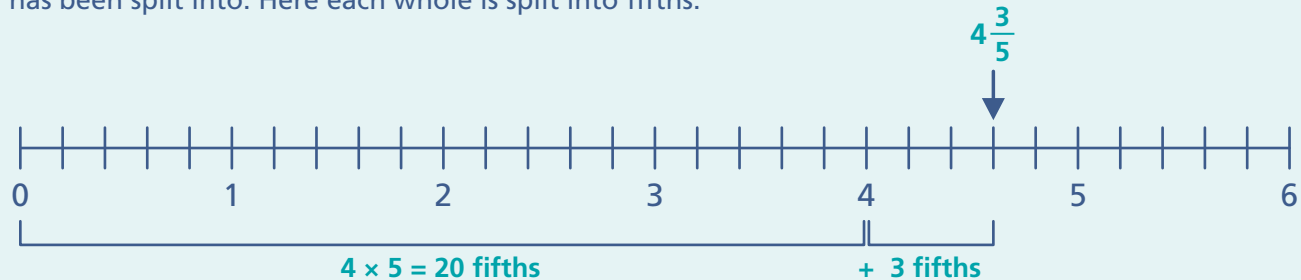
28 Circle all the fractions that simplify to $\frac{3}{5}$. $\frac{15}{25}$ $\frac{32}{40}$ $\frac{35}{45}$ $\frac{36}{60}$ $\frac{30}{50}$

Convert from mixed numbers to improper fractions

Key point

Mixed numbers are numbers that include a whole number and a fraction, such as $4\frac{3}{5}$.

The denominator (the bottom number) of the fraction shows how many equal parts each whole number has been split into. Here each whole is split into fifths.



To write a mixed number as an **improper fraction** (top-heavy fraction), multiply the whole number by the denominator and then add the numerator. This gives you the numerator of the improper fraction. The denominator stays the same.

$4\frac{3}{5} = \frac{23}{5}$ Multiply the 4 by 5 to find how many fifths in 4 wholes and then add the 3.

Get started

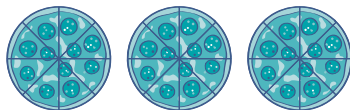
- 1 How many fifths in one whole? 5 fifths



- 2 How many lots of $\frac{1}{10}$ make one whole? 10



- 3 Each pizza is cut into eighths. How many eighths are there altogether here? 24 eighths

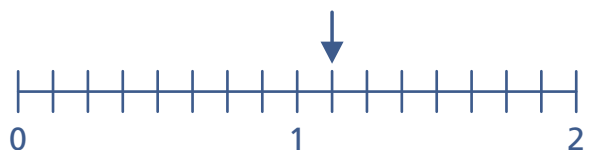


- 4 How many wholes can be made with 20 fifths? 4

- 5 How many halves in $2\frac{1}{2}$? $2\frac{1}{2} = \frac{5}{2}$



- 6 What mixed number does the arrow point to on this number line? $1\frac{1}{8}$



- 7 How many eighths in:
a) 1 whole? 8 eighths
b) $1\frac{1}{8}$? 9 eighths

- 8 How many sixths are there altogether in $2\frac{1}{6}$? 13 sixths



Now try these

- 9 How many quarters in: a) 3 wholes? 12 quarters b) $3\frac{3}{4}$? 15 quarters

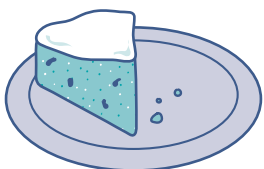
- 10 How many fifths in $6\frac{2}{5}$? $6\frac{2}{5} = \frac{32}{5}$



- 11 Fill in the missing number. $2\frac{3}{5} = \frac{13}{5}$

- 12** True or false? $2\frac{1}{7}$ is equal to $\frac{16}{7}$. True ☐ False ☒ 
- 13** Circle the improper fraction that is equal to $2\frac{4}{5}$. $\frac{22}{5}$ $\frac{24}{5}$ $\frac{14}{5}$ $\frac{14}{4}$
- 14** Write $1\frac{1}{3}$ as an improper fraction. $\frac{4}{3}$
- 15** What is $7\frac{5}{6}$ as an improper fraction? $\frac{47}{6}$ 
- 16** What is the improper fraction equivalent to $3\frac{1}{100}$? $\frac{301}{100}$
- 17** Use the digits 7, 3 and 2 to write an improper fraction that has the same value as $3\frac{2}{7}$. $\frac{23}{7}$
- 18** True or false? $4\frac{5}{12} = \frac{52}{12}$ True ☐ False ☒

Challenge

- 19** Zac has 7 fruit cakes. He cuts each into 8 equal slices for a party. He then eats one of the slices. Are there enough slices left for 54 guests to each have a slice? Yes ☒ No ☐ 
- 20** At an internet café it costs £1 for every quarter of an hour on the internet. How much would you pay for $3\frac{3}{4}$ hours? £ 15
- 21** When converting mixed numbers to improper fractions, Ben says that tenths and hundredths are special because the same digits are used in both. Are his examples all correct?
 $2\frac{3}{10} = \frac{23}{10}$ $7\frac{9}{10} = \frac{79}{10}$ $1\frac{33}{100} = \frac{133}{100}$ $8\frac{67}{100} = \frac{867}{100}$ Yes ☒ No ☐
- 22** Use Ben's pattern to finish these. $4\frac{8}{10} = \frac{48}{10}$ $6.7 = \frac{67}{10}$ $5\frac{34}{100} = \frac{534}{100}$ $5.27 = \frac{527}{100}$
- 23** Leo jumps $4\frac{9}{10}$ m and Kai jumps $\frac{56}{10}$ m. How much further does Kai jump than Leo? $\frac{7}{10}$ m
- 24** A phone company charges 1p per tenth of a minute. How much does a $4\frac{3}{10}$ min call cost? 43 p
- 25** Find the difference between $9\frac{7}{9}$ and $\frac{88}{9}$. 0
- 26** A can of drink holds one-third of a litre. How many cans can be filled with $28\frac{2}{3}$ litres? 86
- 27** Lots of lorries are in a queue waiting to cross a bridge. The queue stretches for $2\frac{37}{40}$ km. If each lorry is $\frac{1}{40}$ km in length, what is the maximum number of lorries that could be in the queue? 117
- 28** Maryam has these 6 cards. Arrange the numbers on the cards to make a true statement.
 4 5 6 8 9 9 $\frac{6}{9} = \frac{5}{9}$

Convert from improper fractions to mixed numbers

Key point

Improper fractions are called top-heavy fractions because the numerator (top number) is larger than the denominator (bottom number), for example $\frac{23}{5}$.

To write an improper fraction as a **mixed number**, divide the numerator by the denominator. The answer is the whole number part of the mixed number and the remainder is the numerator of the fraction. The denominator stays the same.

$\frac{23}{5} = 4\frac{3}{5}$ Divide the numerator **23** by the denominator **5**.
23 divided by 5 is **4 wholes** with **3 fifths** left over.



Get started

- 1 How many wholes are equal to 15 fifths? 3

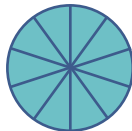


- 2 How many wholes is $\frac{4}{4}$? 1

- 3 Each tart is cut into eighths. How many whole tarts is 16 eighths? 2



- 4 How many tenths in 4 wholes?
40 tenths



- 5 Seven-halves is the same as which mixed number? $3\frac{1}{2}$



- 6 Mark $\frac{12}{6}$ on this number line.



- 7 Mark $\frac{19}{6}$ on this number line.



- 8 Write $\frac{19}{6}$ as a mixed number. $3\frac{1}{6}$

Now try these

- 9 Write five-quarters as a mixed number. $1\frac{1}{4}$




- 10 $\frac{11}{3} = 3\frac{2}{3}$



- 11 $\frac{13}{4} = 3\frac{1}{4}$

- 12 True or false? $\frac{17}{3}$ is equal to $5\frac{2}{3}$. True ☒ False ☐

- 13 Circle the mixed number that is equal to $\frac{13}{8}$. $1\frac{4}{8}$ $2\frac{5}{8}$ $1\frac{2}{8}$ $1\frac{5}{8}$ $1\frac{5}{6}$

- 14** True or false? $\frac{52}{8} = 6\frac{4}{8} = 6\frac{1}{2}$ True ☒ False ☐
- 15** Write $\frac{24}{7}$ as a mixed number. $3\frac{3}{7}$
- 16** Mark $\frac{39}{6}$ on this number line.
- 
- 17** Use your answer for question 16 to complete the mixed number. $\frac{39}{6} = 6\frac{1}{2}$
- 18** Write a mixed number that has the same value as $\frac{23}{3}$ using the digits 7, 3 and 2. $7\frac{2}{3}$

Challenge

- 19** Thirty-two children each bring one-third of a litre of juice to make a fruit punch for the school fair. How many litres of punch can they make? $10\frac{2}{3}$ l
- 20** At an internet café it costs £1 for every quarter of an hour on the internet. Jamie pays £17. How many hours does he pay for? $4\frac{1}{4}$ hr
- 21** When converting improper fractions to mixed numbers, Cameron says that tenths and hundredths are special because the same digits are used in both. Are his examples all correct?
- $\frac{43}{10} = 4\frac{3}{10}$ $\frac{71}{10} = 7\frac{1}{10}$ $\frac{136}{100} = 1\frac{36}{100}$ $\frac{807}{100} = 8\frac{7}{100}$ Yes ☒ No ☐
- 22** Complete these mixed numbers.
- $\frac{43}{10} = 4\frac{3}{10}$ $\frac{151}{10} = 15\frac{1}{10}$ $\frac{223}{100} = 2\frac{23}{100}$ $\frac{1250}{100} = 12\frac{50}{100} = 12\frac{1}{2}$
- 23** True or false? $\frac{65}{15} = 4\frac{5}{15} = 4\frac{1}{3}$ True ☒ False ☐
- 24** Find the difference between $\frac{71}{8}$ and $7\frac{7}{8}$. 1
- 25** A can of lemonade holds one-third of a litre. How many litres are there in 100 cans? $33\frac{1}{3}$ l
- 26** A sewing machine makes stitches that are each $\frac{1}{8}$ of a centimetre long. If the machine makes a line of 42 stitches, with no gaps, how long is the line?
- $5\frac{2}{8}$ cm Also accept $5\frac{1}{4}$
- 27** A phone company charges 1p per tenth of a minute. Find the length of a call that costs 35p in minutes and seconds. 3 min 30 sec
- 28** Amir has these 6 cards. Arrange the numbers on the cards to make a true statement.

1 2 4 5 6 7

$$\frac{45}{6} = 7\frac{1}{2}$$



Add or subtract fractions with the same denominator

Key point

When adding or subtracting fractions, if the denominators are the same, **add or subtract the numerators only**. Use the same denominator. Some answers may be greater than 1. Such answers can be given as an **improper fraction** or a **mixed number**.

$$\begin{array}{l} \text{numerator} \rightarrow \\ \text{denominator} \rightarrow \end{array} \frac{3}{10} + \frac{6}{10} + \frac{4}{10} = \frac{13}{10} = 1\frac{3}{10}$$

improper fraction mixed number

$$\frac{11}{10} - \frac{6}{10} + \frac{2}{10} = \frac{7}{10}$$

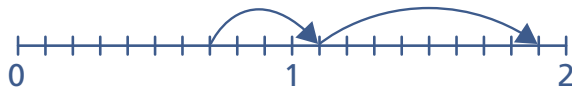
Look carefully at the **signs** to see if you must **add or subtract** each fraction.

Get started

- 1** Colour $\frac{1}{8}$, $\frac{3}{8}$ and $\frac{3}{8}$ of the rectangle.
How many eighths are now coloured?
7 eighths

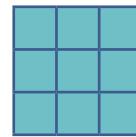


2 $\frac{7}{10} + \frac{4}{10} + \frac{8}{10} = \frac{19}{10}$



3 $\frac{11}{7} - \frac{3}{7} = \frac{8}{7}$

4 $\frac{2}{9} + \frac{3}{9} - \frac{1}{9} = \frac{4}{9}$



5 Decrease by $\frac{9}{8}$ by $\frac{6}{8}$. $\frac{3}{8}$

6 Give the total of $\frac{5}{6}$, $\frac{5}{6}$ and $\frac{3}{6}$ as an improper fraction. $\frac{13}{6}$

7 Add $\frac{4}{5}$ to $\frac{4}{5}$ and then subtract $\frac{2}{5}$. Give your answer as a mixed number. $1\frac{1}{5}$



8 $\frac{13}{12} - \frac{11}{12} = \frac{2}{12}$

Now try these

9 $\frac{15}{100} + \frac{5}{100} - \frac{11}{100} = \frac{9}{100}$

- 10** In a litter of kittens, $\frac{1}{7}$ of them are black, $\frac{2}{7}$ of them are ginger and the rest are brown. What fraction of the kittens are brown? $\frac{4}{7}$



11 Find the values of a and b . $\frac{22}{10} - \frac{3}{10} = \frac{a}{10} = 1\frac{b}{10}$ $a = \underline{19}$ $b = \underline{9}$

12 Give the sum of five-sixths, two-sixths and ten-sixths as a mixed number. $2\frac{5}{6}$

13 Write the answer as a mixed number. $\frac{4}{12} + \frac{9}{12} - \frac{4}{12} + \frac{10}{12} = \underline{1\frac{7}{12}}$

- 14** Three identical fractions have a total of $1\frac{4}{5}$. 
What is each fraction? $\frac{3}{5}$

- 15** $\frac{5}{15} = \frac{1}{3}$ Use this fact to help you find the difference between $\frac{13}{15}$ and $\frac{1}{3}$. $\frac{8}{15}$

- 16** Subtract $\frac{3}{8}$ from $\frac{7}{8}$ and give your answer as an equivalent fraction with the numerator 1. $\frac{1}{2}$

- 17** $\frac{17}{100}$ $\frac{15}{100}$ $\frac{19}{100}$ $\frac{24}{100}$ $\frac{21}{100}$

Look at the fractions above. What is the largest fraction minus the smallest fraction? $\frac{9}{100}$

- 18** Subtract $\frac{12}{20}$ from $\frac{17}{20}$ and give your answer as an equivalent fraction with the numerator 1. $\frac{1}{4}$

Challenge

- 19** When $\frac{6}{10}$ m is subtracted from $\frac{9}{10}$ m, how much less than 2 metres is the result? $1\frac{7}{10}$ m

- 20** What mixed number is subtracted from the sum of $\frac{12}{9}$ and $\frac{3}{9}$ to give the answer $\frac{5}{9}$? $1\frac{1}{9}$

- 21** Write the answer as an improper fraction and as a mixed number. $\frac{21}{15} + \frac{9}{15} - \frac{11}{15}$
a) improper fraction $\frac{19}{15}$ b) mixed number $1\frac{4}{15}$

- 22** Zara uses $\frac{125}{100}$ kg from a full 2kg bag of coffee.
What fraction of a kilogram is left? $\frac{75}{100}$ or $\frac{3}{4}$ kg



- 23** Jake jogs a distance of 10km in 1 hour. After 35 minutes he has jogged $\frac{7}{12}$ of the distance.
What fraction of the distance does he complete in the next 25 minutes? $\frac{5}{12}$

- 24** Peter spent $\frac{5}{12}$ of an hour watching a cartoon, $\frac{5}{12}$ of an hour watching a comedy and $\frac{6}{12}$ of an hour watching a quiz show.

- a) What is the total time he spent watching these programmes? $1\frac{4}{12}$ hr = $1\frac{1}{3}$ hr
b) How many minutes is this? 80 min



- 25** $\frac{15}{24} = \frac{5}{8}$ and $\frac{2}{8} = \frac{1}{4}$ Use these facts to help you find the sum of $\frac{15}{24}$ and $\frac{1}{4}$ in eighths. $\frac{7}{8}$

- 26** $\frac{25}{60} = \frac{5}{12}$ and $\frac{6}{12} = \frac{1}{2}$ Use these facts to help you find the sum of 25 minutes and half an hour. $\frac{11}{12}$ of an hour

- 27** Paige pours $\frac{5}{8}$ litres from a full litre jug of juice. What fraction of a litre is left? $\frac{3}{8}$ l

- 28** From a full 2-litre jug of water Sam pours $\frac{5}{4}$ litres.
What fraction of a litre is left? $\frac{3}{4}$ l



Add or subtract fractions with different denominators

Key point

When adding or subtracting fractions, if the denominators are the same, **add or subtract the numerators only**. Use the same denominator. If the denominators are not the same, first **change one or both fractions to an equivalent fraction to make the denominators the same**.

numerator \rightarrow $\frac{1}{10} + \frac{3}{5} = \frac{1}{10} + \frac{6}{10} = \frac{7}{10}$
 denominator \rightarrow

Change **the fraction with the smaller denominator**, if you only need to change one of them.

numerator \rightarrow $\frac{11}{12} - \frac{3}{8} = \frac{22}{24} - \frac{9}{24} = \frac{13}{24}$
 denominator \rightarrow

Get started

1 $\frac{1}{2}$ is equivalent to $\frac{3}{6}$.
Use this fact to find $\frac{1}{2} + \frac{1}{6} = \frac{4}{6}$ or $\frac{2}{3}$

2 $\frac{1}{2}$ is equivalent to $\frac{2}{4}$.
Use this fact to find $\frac{1}{4} + \frac{1}{2} = \frac{3}{4}$

3 Change $\frac{2}{5}$ to tenths to answer this question.

$\frac{2}{5} + \frac{3}{10} = \frac{4}{10} + \frac{3}{10} = \frac{7}{10}$

4 $\frac{3}{4} + \frac{1}{8} = \frac{6}{8} + \frac{1}{8} = \frac{7}{8}$

5 $\frac{4}{9} + \frac{1}{3} = \frac{4}{9} + \frac{2}{9} = \frac{6}{9}$

6 Change $\frac{5}{6}$ to twelfths to find the total of $\frac{5}{6}$ and $\frac{1}{12} = \frac{11}{12}$

7 $\frac{1}{2} - \frac{1}{12} = \frac{6}{12} - \frac{1}{12} = \frac{5}{12}$

8 $\frac{1}{5} - \frac{1}{10} = \frac{2}{10} - \frac{1}{10} = \frac{1}{10}$

Now try these

9 $\frac{2}{3} - \frac{1}{12} = \frac{8}{12} - \frac{1}{12} = \frac{7}{12}$



10 What is the sum of $\frac{4}{5}$ and $\frac{1}{10}$? $\frac{9}{10}$

11 Fill in the missing numbers. $\frac{3}{10} + \frac{5}{100} = \frac{30}{100} + \frac{5}{100} = \frac{35}{100}$

12 $\frac{5}{15} = \frac{1}{3}$ Use this fact to help you find the difference between $\frac{13}{15}$ and $\frac{1}{3} = \frac{8}{15}$

- 13** True or false? $\frac{3}{4} - \frac{1}{8} = \frac{5}{8}$ True ☒ False ☐
- 14** Find the values of a , b and c . $\frac{9}{10} - \frac{1}{2} = \frac{9}{10} - \frac{a}{10} = \frac{b}{10} = \frac{c}{5}$
 $a = \underline{5}$ $b = \underline{4}$ $c = \underline{2}$
- 15** Give the sum of five-sixths and one-third as an improper fraction. $\underline{\frac{7}{6}}$
- 16** Write the answer as a mixed number. $\frac{4}{12} + \frac{3}{4} = \boxed{1 \frac{1}{12}}$
- 17** $\frac{25}{60} = \frac{5}{12}$ and $\frac{1}{2} = \frac{6}{12}$ Use these facts to help you find the sum of $\frac{25}{60}$ and $\frac{1}{2}$ in twelfths. $\underline{\frac{11}{12}}$
- 18** Subtract $\frac{1}{4}$ from $\frac{6}{8}$ and give your answer as an equivalent fraction with the numerator 1. $\underline{\frac{1}{2}}$

Challenge

- 19** $\frac{2}{9} + \frac{5}{9} - \frac{2}{3} = \boxed{\frac{1}{9}}$
- 20** Change both fractions to twelfths to find the total. $\frac{1}{4} + \frac{1}{6} = \boxed{\frac{3}{12}} + \boxed{\frac{2}{12}} = \boxed{\frac{5}{12}}$
- 21** Li jogs $\frac{2}{5}$ km and then runs $4\frac{7}{10}$ km. How much more than 5 km does she go in total?
 Give your answer as: a) a fraction. $\underline{\frac{1}{10}}$ km b) a decimal. $\underline{0.1}$ km
- 22** Write the answer as an improper fraction and then as a mixed number.
 $\frac{7}{5} + \frac{3}{5} + \frac{11}{15} = \boxed{\frac{41}{15}} = \boxed{2 \frac{11}{15}}$
- 23** True or false? The answer to this question is zero. $\frac{2}{5} + \frac{3}{10} - \frac{1}{2} = ?$ True ☐ False ☒
- 24** Priya spent $\frac{5}{12}$ of an hour watching a cartoon, $\frac{5}{6}$ of an hour watching a comedy and $\frac{1}{4}$ of an hour watching a quiz show. What is the total time she spent watching these? $\boxed{1 \frac{6}{12}} \text{ hr} = \boxed{1 \frac{1}{2}} \text{ hr}$
- 25** Seb pours $\frac{3}{10}$ litres (0.3l) from a full litre jug of juice into one glass and then $\frac{33}{100}$ litres (0.33l) into another glass. What fraction of a litre remains in the jug? $\underline{\frac{37}{100}}$ l
- 26** Hayley has a 1 kg bag of sugar. She uses $\frac{3}{5}$ kg (0.6 kg) for some cakes and then 0.35 kg for some biscuits. What fraction of a kilogram of sugar is left in the bag? $\underline{\frac{5}{100}}$ kg Also accept $\underline{\frac{1}{20}}$
- 27** Change both fractions to twelfths to find the total. Then simplify the answer.
 $\frac{2}{4} + \frac{1}{3} = \boxed{\frac{6}{12}} + \boxed{\frac{4}{12}} = \boxed{\frac{10}{12}} = \boxed{\frac{5}{6}}$
- 28** What is the sum of $\frac{3}{4}$ of an hour and $\frac{1}{3}$ of an hour? Give your answer as a mixed number. $\underline{1 \frac{1}{12}}$ hr



Check-up test 1

- 1 What number is missing?

$$\frac{3}{5} \text{ is equivalent to } \frac{6}{10}.$$



1 mark

- 2 For each diagram write the fraction of the shape that is turquoise. Write a fraction with a different denominator each time.



1 mark



1 mark

- 3 How many hundredths are equivalent to three-quarters? 75 hundredths

- 4 Theo notices that $\frac{9}{10}$ of some counters are orange.

If there are 90 orange counters, how many counters are there in total? 100



1 mark

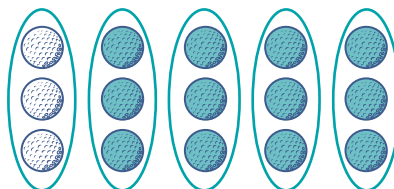


1 mark

- 5 True or false? $\frac{3}{5} = \frac{6}{10}$ True ☒ False ☐

- 6 3 of these 15 golf balls are white. The golf balls are grouped into fifths.

How many fifths are white? $\frac{3}{15} = \frac{1}{5}$



1 mark

- 7 Dev says that $\frac{6}{8}$ and $\frac{9}{12}$ are not equivalent. Is he correct? Yes ☐ No ☒



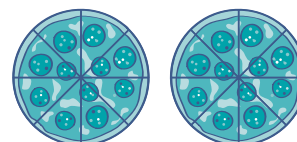
1 mark



1 mark

- 8 Write $\frac{12}{32}$ as an equivalent fraction with a denominator that is less than 10. $\frac{3}{8}$

- 9 Each pizza is cut into eighths. How many eighths are there altogether here? 16 eighths



1 mark

- 10 How many quarters in:

a) 4 wholes? 16 quarters

b) $2\frac{3}{4}$? 11 quarters



1 mark

- 11 True or false? $2\frac{1}{7}$ is equal to $\frac{15}{7}$.

True ☒ False ☐



1 mark

- 12 An internet café charges 1p per tenth of a minute.

How much does it cost to use the internet for $3\frac{7}{10}$ minutes? 37 p



1 mark

- 13 How many wholes are equal to 10 fifths? 2


☐

1 mark

- 14 True or false? $\frac{14}{3}$ is equal to $5\frac{1}{3}$. True ☐ False ☒

☐

1 mark

- 15 Ava uses the digits 1, 3 and 6 to write a mixed number that has the same value as $\frac{19}{3}$. What is the mixed number? $6\frac{1}{3}$

☐

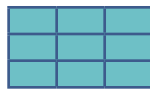
1 mark

- 16 A phone company charges 1p per tenth of a minute. Find the length of a call that costs 45p in minutes and seconds. 4 min 30 sec

☐

1 mark

- 17 $\frac{1}{9} + \frac{5}{9} - \frac{1}{9} = \frac{5}{9}$


☐

1 mark

- 18 On a bird table, $\frac{3}{8}$ of the birds are robins, $\frac{2}{8}$ of them are sparrows and the rest are thrushes. What fraction of the birds are thrushes? $\frac{3}{8}$


☐

1 mark

- 19 Subtract $\frac{14}{20}$ from $\frac{19}{20}$ and give your answer as an equivalent fraction with the numerator 1. $\frac{1}{4}$

☐

1 mark

- 20 Bella rows a distance of 10km in 1 hour. After 50 minutes she has rowed $\frac{10}{12}$ of the distance. What fraction of the distance does she row in the next 10 minutes? $\frac{2}{12}$ or $\frac{1}{6}$


☐

1 mark

- 21 Complete this.
 $\frac{2}{9} + \frac{2}{3} = \frac{2}{9} + \frac{?}{9} = \frac{8}{9}$


☐

1 mark

- 22 True or false? $\frac{7}{8} - \frac{1}{4} = \frac{5}{8}$

True ☒ False ☐

☐

1 mark

- 23 Write the answer as a mixed number.

$$\frac{11}{12} + \frac{1}{4} = 1\frac{2}{12} \quad \text{Also accept } 1\frac{1}{6}$$

☐

1 mark

- 24 What fraction of an hour is the sum of $\frac{3}{4}$ of an hour and $\frac{2}{3}$ of an hour?

Give your answer as a mixed number. $1\frac{5}{12}$ hr

☐

1 mark

Total

24 marks

Compare fractions with different denominators

Key point

When comparing fractions, if the denominators are the same, **compare the numerators only**.

If the denominators are not the same, first **change one or both fractions to an equivalent fraction to make the denominators the same**. This makes them easier to compare.

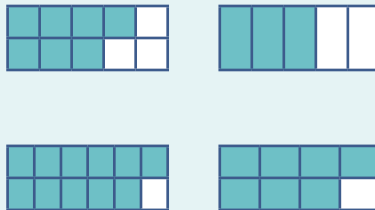
Which is larger?

numerator \Rightarrow $\frac{7}{10}$ or $\frac{3}{5}$ $\frac{7}{10}$ or $\frac{6}{10}$ $\frac{7}{10}$ is larger.

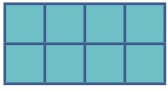
denominator \Rightarrow $\frac{7}{10}$ or $\frac{6}{10}$ $\frac{7}{10}$ or $\frac{6}{10}$

numerator \Rightarrow $\frac{11}{12}$ or $\frac{7}{8}$ $\frac{22}{24}$ or $\frac{21}{24}$ $\frac{11}{12}$ is larger.

denominator \Rightarrow $\frac{11}{12}$ or $\frac{7}{8}$ $\frac{22}{24}$ or $\frac{21}{24}$



Get started

- Circle the fraction that is larger. $\frac{4}{6}$ $\frac{3}{6}$
- Use $<$ or $>$ to show which is larger.
 $\frac{5}{8}$ $>$ $\frac{4}{8}$

- Given that $\frac{1}{2} = \frac{3}{6}$, circle the larger fraction.
 $\frac{1}{2}$ $\frac{4}{6}$
- Change $\frac{2}{5}$ to tenths to help you find the smaller fraction: $\frac{2}{5}$ or $\frac{3}{10}$.
 $\frac{2}{5}$ or $\frac{3}{10} = \frac{6}{10}$ or $\frac{3}{10}$ $\frac{3}{10}$
- Given that $\frac{1}{3} = \frac{3}{9}$, circle the larger fraction.
 $\frac{2}{9}$ $\frac{1}{3}$
- True or false? $\frac{3}{4} > \frac{7}{8}$
 $\frac{3}{4} > \frac{7}{8}$ $\frac{?}{8} > \frac{7}{8}$ True ☐ False ☒
- Change $\frac{5}{6}$ to twelfths to help you find the larger fraction: $\frac{5}{6}$ or $\frac{9}{12}$. $\frac{5}{6}$ or $\frac{10}{12}$
- Which is smaller: $\frac{8}{20}$ or $\frac{1}{4}$? $\frac{1}{4}$ or $\frac{5}{20}$

Now try these

- True or false? $\frac{3}{4}$ is larger than $\frac{13}{20}$. True ☒ False ☐
- Fill in the missing numbers. Write whether **a**, **b** or **c** is largest.
 a) $\frac{2}{3} = \frac{8}{12}$ b) $\frac{5}{6} = \frac{10}{12}$ c) $\frac{1}{2} = \frac{6}{12}$ **b** is largest.
- Use $<$ or $>$ to show which is larger. $\frac{6}{10}$ $<$ $\frac{4}{5}$
- Which is larger: five-sixths or two-thirds? five-sixths
- Megan's red mug holds $\frac{3}{10}$ l and her blue mug holds $\frac{33}{100}$ l. Which holds more? the blue mug

- 14 $\frac{5}{15} = \frac{1}{3}$ Use this fact to help you order the fractions from smallest to largest.

$\frac{7}{15}$ $\frac{1}{3}$ $\frac{4}{15}$ $\frac{4}{15}$ $\frac{1}{3}$ $\frac{7}{15}$

- 15 Change the fractions to eighths and then write them in order from smallest to largest.

$\frac{3}{4}$ $\frac{5}{8}$ $\frac{1}{2}$ $\frac{4}{8}$ $\frac{5}{8}$ $\frac{6}{8}$

- 16 Nicole wins some money in a competition. She gives $\frac{5}{12}$ of the money to her daughter and $\frac{1}{3}$ of the money to her niece. Who gets more: her daughter or her niece? her daughter



- 17 Write these fractions in order from smallest to largest.

$\frac{3}{10}$ $\frac{1}{5}$ $\frac{17}{100}$ $\frac{17}{100}$ $\frac{1}{5}$ $\frac{3}{10}$

- 18 Write < or > between these fractions so that the statement is true. $\frac{1}{2}$ < $\frac{7}{12}$ < $\frac{3}{4}$

Challenge

- 19 True or false? $\frac{5}{8} > \frac{3}{4} > \frac{3}{8}$ True ☐ False ☒

- 20 Order these fractions from largest to smallest. $\frac{7}{18}$ $\frac{2}{3}$ $\frac{5}{9}$ $\frac{2}{3}$ $\frac{5}{9}$ $\frac{7}{18}$

- 21 To get to school, Kirstin walks $\frac{4}{5}$ km, George walks $\frac{7}{10}$ km and Ella walks $\frac{13}{20}$ km.

a) Who walks the furthest? Kirstin

b) Who walks the shortest distance? Ella



- 22 A cartoon lasts for $\frac{5}{12}$ of an hour. A quiz lasts for $\frac{1}{3}$ of an hour. A comedy lasts for $\frac{3}{4}$ of an hour. Which programme lasts longest? the comedy

- 23 Fill in the missing digit so that the statement is true. $\frac{1}{2} < \frac{5}{8} < \frac{3}{4}$

- 24 Tim uses $\frac{2}{5}$ kg of flour and then 0.35kg ($\frac{35}{100}$ kg) of sugar in a cake recipe. Which does he use more of: flour or sugar? flour



- 25 What is the missing digit? $\frac{3}{4} < \frac{4}{5} < \frac{17}{20}$

- 26 $\frac{7}{5}$ $\frac{30}{25}$ $\frac{66}{50}$ $\frac{13}{10}$ Alice converts these fractions to hundredths to make them easier to compare.

Which of Alice's original fractions is: a) largest? $\frac{7}{5}$ b) smallest? $\frac{30}{25}$

- 27 On a number line, which two fractions with the denominator 10 lie between $\frac{1}{2}$ and $\frac{3}{4}$? $\frac{6}{10}$ $\frac{7}{10}$



- 28 Which of these questions has the largest answer? Circle it. $\frac{1}{3} + \frac{3}{10}$ $\frac{1}{6} + \frac{3}{15}$ $\frac{29}{30} - \frac{1}{2}$

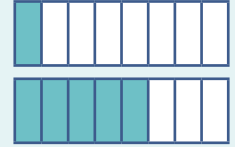
Find fractions of numbers and quantities

Key point

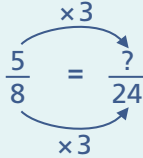
To find a fraction of a quantity, divide the quantity by the denominator (to find one part) and multiply by the numerator (to find several parts).

numerator \rightarrow $\frac{5}{8}$ of 24 Divide by 8 to find **one-eighth**. $24 \div 8 = 3$

denominator \rightarrow Then multiply by 5 to find **five-eighths**. $3 \times 5 = 15$



Alternatively, you can use equivalent fractions. $\frac{5}{8} = \frac{?}{24}$ The missing number is 15.

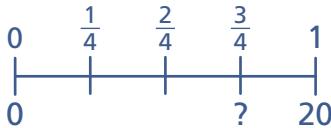


Get started

1 If $\frac{1}{5}$ of 35cm is 7cm, what is $\frac{2}{5}$ of 35cm?
14 cm



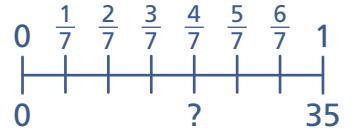
2 Find $\frac{3}{4}$ of 20.
15



3 Find $\frac{7}{10}$ of 30kg. 21 kg

4 Find $\frac{9}{10}$ of 50ml. 45 ml

5 Find $\frac{4}{7}$ of 35cm. 20 cm



6 True or false? $\frac{5}{8} = \frac{50}{80}$, so $\frac{5}{8}$ of 80 = 50
 True ☒ False ☐

7 Given that $\frac{3}{8} = \frac{15}{40}$, find $\frac{3}{8}$ of £40.
 £ 15

8 If $\frac{5}{6} = \frac{35}{42}$, what is $\frac{5}{6}$ of 42? 35

Now try these

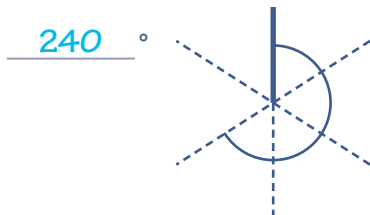
9 True or false? $\frac{3}{7} = \frac{21}{49}$, so $\frac{3}{7}$ of 21 = 49 True ☐ False ☒

10 Find seven-ninths of 36p. 28 p

11 How many minutes in $\frac{11}{12}$ of an hour? $\frac{11}{12} = \frac{?}{60}$ 55 min



12 A full turn is 360° . How many degrees in $\frac{4}{6}$ of a full turn?



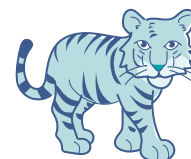
13 Heidi takes three-quarters of the money in each bag. How much does she take in total? £ 57



- 14** A young tiger is $\frac{9}{11}$ the height of his father. His father is 121cm tall.

a) How tall is the young tiger? 99 cm

b) How many centimetres taller than the young tiger is his father? 22 cm



- 15** Seth draws a line that is $\frac{7}{8}$ the length of line A.

How long is Seth's line? 21 cm

Line A

24cm

- 16** Urvi draws a line that is $\frac{3}{12}$ longer than line B.

How long is Urvi's line? 45 cm

Line B

36cm

- 17** $\frac{3}{8} = \frac{75}{200}$ Use this fact to help you answer the question.

How much less than 2m is $\frac{3}{8}$ of 200cm? 125 cm

- 18** Fill in the missing number. $\frac{5}{6}$ of 48m = 40m

Challenge

- 19** Find the difference in kilograms between $\frac{3}{5}$ of 65kg and $\frac{5}{6}$ of 66kg. 16 kg

- 20** $\frac{2}{3}$ of £270 $\frac{3}{8}$ of £400 $\frac{61}{100}$ of £300

Look at the fractions above. What is the value of: a) the largest of these amounts? £ 183

b) the smallest of these amounts? £ 150 c) the total of these amounts? £ 513

- 21** 47 hundredths = $\frac{47}{100} = 0.47$. What is 47 hundredths of £200? £ 94

- 22** True or false? 0.45 of £200 = £90 True ☒ False ☐

- 23** $\frac{1}{5}$ of an hour is 12 minutes. What fraction of an hour is 36 minutes? $\frac{3}{5}$ hr

- 24** $\frac{1}{30}$ of an hour is 2 minutes. What fraction of an hour is 38 minutes? $\frac{19}{30}$ hr

- 25** Find the difference between $\frac{6}{7}$ of 56 litres and $\frac{7}{8}$ of 56 litres. 1 l

- 26** David has £120. He gives $\frac{1}{3}$ of the money to his son and $\frac{3}{8}$ to his daughter.
How much more money does his daughter get than his son? £ 5

- 27** Josie has 54 doggy treats. She gives $\frac{1}{3}$ of the treats to Buster and $\frac{5}{9}$ of them to Jess. How many treats are left? 6



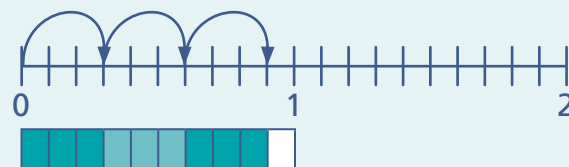
- 28** The width of a rectangle is $\frac{5}{6}$ of its length. Its length is 72mm.
Find the perimeter of the rectangle in centimetres. 26.4 cm

Multiply fractions by whole numbers

Key point

When multiplying a fraction by a whole number, **multiply only the numerator by the whole number**. The denominator stays the same. So, if the fraction is thirds you end up with thirds or if the fraction is tenths you end up with tenths.

$$\begin{array}{l} \text{numerator} \longrightarrow \frac{3}{10} \times 3 = \frac{9}{10} \\ \text{denominator} \longrightarrow \end{array}$$



Some answers may be greater than 1. If so, the answers can be given as an improper fraction, a mixed number or a whole number.

$$\frac{5}{8} \times 9 = \frac{45}{8} = 5\frac{5}{8}$$

improper fraction mixed number

$$\frac{5}{8} \times 8 = \frac{40}{8} = 5$$

improper fraction whole number

Get started

1 $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{3}{8}$

2 How many fifths is $\frac{2}{5} \times 2$? $\frac{4}{5}$

3 Multiply $\frac{3}{7}$ by 2. $\frac{6}{7}$

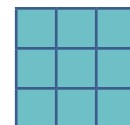


4 Colour $\frac{2}{9}$, $\frac{2}{9}$, $\frac{2}{9}$ and $\frac{2}{9}$ of this square. Then answer the question.

$$\frac{2}{9} \times 4 = \frac{8}{9}$$

5 True or false? Three lots of $\frac{3}{9}$ is one whole.

True ☒ False ☐



6 Write the answer as an improper fraction:

$$\frac{2}{3} \times 4 = \frac{8}{3}$$

7 Find $\frac{5}{6} \times 3$.



Give your answer as an improper fraction. $\frac{15}{6}$

8 Find $\frac{2}{10} \times 3$. $\frac{6}{10}$

Now try these

9 True or false? $\frac{1}{3} \times 4 = \frac{4}{12}$ True ☐ False ☒

10 Write the answer to $3 \times \frac{3}{5}$ as an improper fraction. $\frac{9}{5}$

11 Write the answer to $3 \times \frac{3}{5}$ as a mixed number. $1\frac{4}{5}$

12 What is $5 \times \frac{3}{4}$ as an improper fraction? $\frac{15}{4}$

13 Mark the answer to $\frac{3}{10} \times 6$ on this number line.



14 How many lots of $\frac{3}{4}$ makes $\frac{21}{4}$ or $5 \frac{1}{4}$? 7

15 Circle which is more. $9 \times \frac{1}{5}$ $\frac{2}{5} \times 4$

16 $\frac{20}{5}$ is equivalent to the whole number 4. What must you multiply $\frac{4}{5}$ by to get 4? 5

17 Jan walks $\frac{3}{12}$ km each day for 4 days. How many kilometres is this? $\frac{12}{12}$ or 1 km

18 Write the answer to $7 \times \frac{3}{10}$ as a mixed number. $2 \frac{1}{10}$

Challenge

19 How much greater is $\frac{3}{8} \times 5$ than $5 \times \frac{2}{8}$? $\frac{5}{8}$

20 Ibrahim runs $\frac{3}{7}$ km each day for a week. How many kilometres does he run in total?
Write your answer as a whole number. 3 km

21 Mel's favourite song plays for $\frac{5}{6}$ of a minute. If Mel plays it 5 times in a row without a gap, how long does this take? Give your answer as a mixed number. $4 \frac{1}{6}$ min



22 Fill in the missing numbers to find the answer to the question in its simplest form.

$$\frac{15}{100} \times 4 = \frac{60}{100} = \frac{6}{10} = \frac{3}{5}$$

23 A carton of juice holds $\frac{33}{100}$ litre. How much less than one litre do three cartons hold? $\frac{1}{100}$ l

24 Mollie's stride is $\frac{3}{5}$ m. What is the length of 11 of her strides?
Give your answer as a mixed number. $6 \frac{3}{5}$ m

25 Each episode of a TV series is $\frac{3}{4}$ hour. When watching the episodes without a break,
how many hours would it take to watch: a) 5 episodes? $3 \frac{3}{4}$ hr b) 12 episodes? 9 hr

26 Nine people went out for pizza. Each person ate $\frac{5}{8}$ of a pizza.

What is the smallest number of pizzas that they could have bought? 6



27 On a number line, Hannah counts on from zero in equal steps of $\frac{7}{10}$. What number does she land on after 7 steps? Give your answer as: a) a mixed number. $4 \frac{9}{10}$ b) a decimal. 4.9

28 Given that $0.09 = \frac{9}{100}$, find the answer to 0.09×12 . Give your answer as:

a) an improper fraction in hundredths. b) a mixed number in hundredths. c) a decimal.

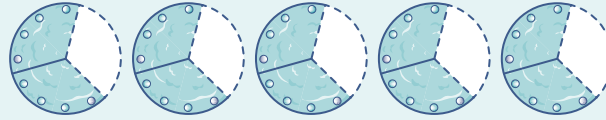
a) $\frac{108}{100}$ b) $1 \frac{8}{100}$ c) 1.08

Multiply fractions and mixed numbers by whole numbers

Key point

When multiplying a fraction by a whole number, **multiply only the numerator by the whole number**. The denominator stays the same.


$$\begin{array}{l} \text{numerator} \rightarrow \frac{2}{3} \times 5 = \frac{10}{3} = 3\frac{1}{3} \\ \text{denominator} \rightarrow \end{array}$$





When multiplying a mixed number, **multiply both parts separately and then add the answers together**.

$$2\frac{2}{3} \times 5 = (2 \times 5) + (\frac{2}{3} \times 5) = 10 + 3\frac{1}{3} = 13\frac{1}{3}$$

Get started

1 $\frac{1}{2} \times 5 = \frac{5}{2} = 2\frac{1}{2}$ 

2 $\frac{1}{2} \times 7 = \frac{7}{2} = 3\frac{1}{2}$ 

3 $\frac{3}{4} \times 3 = \frac{9}{4} = 2\frac{1}{4}$ 

4 Multiply $1\frac{1}{5}$ by 6. Give your answer as a mixed number.

$$1\frac{1}{5} \times 6 = 6\frac{6}{5} = 7\frac{1}{5}$$


5 What is $\frac{2}{5} \times 4$ written as a mixed number?

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


6 Write $\frac{3}{10} \times 7$ as a mixed number. $2\frac{1}{10}$




7 Colour $\frac{2}{9} \times 4$ on this grid.



8 Count the stars to find the answer.

$$1\frac{1}{2} \times 3 = 4\frac{1}{2}$$


Now try these

9 Count the doughnuts to find the answer. $1\frac{1}{4} \times 3 = 3\frac{3}{4}$ 

10 Fill in the missing numbers. $1\frac{2}{9} \times 4 = (1 \times 4) + (\frac{2}{9} \times 4) = 4 + \frac{8}{9} = 4\frac{8}{9}$

11 $3\frac{1}{3} \times 2 = (3 \times 2) + (\frac{1}{3} \times 2) = 6 + \frac{2}{3} = 6\frac{2}{3}$

12 $2\frac{1}{4} \times 3 = (2 \times 3) + (\frac{1}{4} \times 3) = 6 + \frac{3}{4} = 6\frac{3}{4}$

13 $4\frac{1}{2} \times 3 = (4 \times 3) + (\frac{1}{2} \times 3) = 12 + 1\frac{1}{2} = 13\frac{1}{2}$

- 14** Mark the answer on this line.



15 $5\frac{3}{8} \times 2 = (\boxed{5} \times 2) + (\frac{\boxed{3}}{\boxed{8}} \times 2) = 10 + \frac{\boxed{6}}{\boxed{8}} = 10\frac{\boxed{6}}{\boxed{8}}$

- 16** Multiply $5\frac{3}{10}$ by 3. Write the answer as a mixed number. $15\frac{9}{10}$

- 17** What is three and four-ninths multiplied by 2? $6\frac{8}{9}$

- 18** Fill in the missing numbers to find $2\frac{2}{5} \times 3$.

$$2\frac{2}{5} \times 3 = (\boxed{2} \times 3) + (\frac{\boxed{2}}{\boxed{5}} \times 3) = \boxed{6} + \boxed{1\frac{1}{5}} = \boxed{7\frac{1}{5}}$$

Challenge

- 19** What is $7 \times 1\frac{3}{10}$? Write the answer as a mixed number. $9\frac{1}{10}$

- 20** Amelie cycled $1\frac{1}{6}$ km each day for a week.

How many kilometres did she cycle in total? $8\frac{1}{6}$ km

- 21** Find nine lots of $2\frac{3}{4}$ kg. $24\frac{3}{4}$ kg



- 22** How much greater is $1\frac{3}{5} \times 4$ than $3 \times 1\frac{4}{5}$? 1

- 23** Find the product of $3\frac{2}{3}$ and 6. Give your answer as a whole number. 22

- 24** A printing press takes $1\frac{5}{6}$ minutes to print 1 book. How long does it take to print 10 books?

a) Give your answer as a mixed number. $18\frac{2}{6}$ min *Also accept $18\frac{1}{3}$*

b) Give your answer in minutes and seconds. 18 min 20 sec

- 25** A bottle of lemonade holds $1\frac{3}{4}$ l. How much less than 20 l do 11 bottles hold? $\frac{3}{4}$ l



- 26** Some cubes are each $8\frac{7}{10}$ cm (8.7cm) tall. If seven cubes are stacked to make a tower, how tall is the tower as: a) a mixed number? $60\frac{9}{10}$ cm b) a decimal? 60.9 cm

- 27** Arrange the digits 3, 5 and 6 into these boxes so that the multiplication makes the largest answer possible. Then write the answer.

$$\boxed{5\frac{2}{3}} \times \boxed{6} = \boxed{34}$$

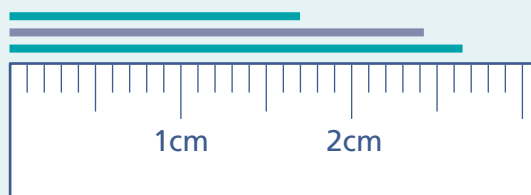
- 28** Fill in the missing numbers. $\boxed{3\frac{4}{5}} \times 7 = 21 + \frac{\boxed{28}}{\boxed{5}} = 21 + 5\frac{3}{5} = 26\frac{3}{5}$

Round decimals to the nearest whole number and tenth

Key point

The digits after the decimal point are called **decimal places**. A number like 3.42 has two decimal places. The headings in the grid stand for **ones**, **tenths** and **hundredths**.

O	t	h
3	4	2



When rounding decimals to the **nearest whole number**, look at the **tenths** digit. If it is 5 or more, round up. If not, round down.

$$1.7 \rightarrow 2 \quad 2.43 \rightarrow 2$$

When rounding decimals to the **nearest tenth (to one decimal place)**, look at the **hundredths** digit. If it is 5 or more, round up. If not, round down.

$$2.43 \rightarrow 2.4 \quad 2.65 \rightarrow 2.7$$

Get started

- 1 Mark 0.6 on this number line.



- 2 Look at the number line.
Is 0.6 nearer to 0 or 1? 1

- 3 Which whole number is 5.8 closest to: 5 or 6? 6

- 4 Round 7.9 to the nearest whole number. 8

- 5 What is 8.2 rounded to the nearest whole number? 8

- 6 Circle the tenths digit in this number. 5. 4 9

- 7 Is the tenths digit of 5.49 five or higher?
Yes ☐ No ☒

- 8 True or false? 5.49 is 5 when rounded to the nearest whole number.

True ☒ False ☐

Now try these

- 9 Is the tenths digit of 3.72 five or higher? Yes ☒ No ☐

- 10 What is 3.72 rounded to the nearest whole number? 4

- 11 What is 2.99 rounded to the nearest whole number? 3

- 12 Which whole number is 3.21 closest to? 3

- 13 A baby weighs 7.5kg. What is this weight rounded to the nearest whole kilogram? 8 kg



- 14 Circle the decimal that is 6 when rounded to the nearest whole number.

4.9 5.3 6.7 6.5 5.6

- 15** Circle the two decimals that are 4 when rounded to the nearest whole number.

4.91 3.73 5.03 4.50 3.45 4.09

- 16** Mark the decimal 3.72 on this line.



- 17** Is the hundredths digit of the decimal 3.72 five or higher? Yes ☐ No ☒

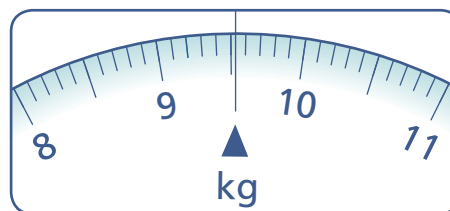
- 18** What is 3.72 rounded to one decimal place? 3.7

Challenge

- 19** Fill in the gaps in the table.

decimal	to the nearest tenth
3.46	3.5
2.71	<u>2.7</u>
6.85	<u>6.9</u>

- 20** When rounded to the nearest tenth of a kilogram, what does 9.52kg round to? 9.5 kg



- 21** True or false? 5.29 is 5 when rounded to the nearest tenth. True ☐ False ☒

- 22** Is 3.36m closer to: a) 3m or 4m? 3 m b) 3.3m or 3.4m? 3.4 m

- 23** Round 5.38 to: a) the nearest whole number. 5 b) the nearest tenth. 5.4

- 24** Is £7.74 million closer to: a) £7 million or £8 million? £ 8 million
b) £7.7 million or £7.8 million? £ 7.7 million

- 25** What is the smallest decimal with two decimal places that, when rounded to the nearest tenth, is 2.8? 2.75

- 26** Circle all the decimals that round to 5.0 when rounded to the nearest tenth.

4.98 4.91 5.20 5.31 5.06 5.02

- 27** Round 9.49 to: a) the nearest whole number. 9 b) one decimal place. 9.5

- 28** Fill in the gaps in the table.

decimal	to the nearest whole number	to one decimal place
6.02	6	6.0
8.55	9	<u>8.6</u>
9.98	<u>10</u>	<u>10.0</u>

Understand thousandths as fractions and decimals


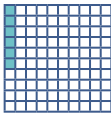
Key point

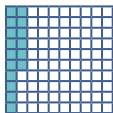
The digits that come after the decimal point stand for **tenths**, **hundredths**, **thousandths** and so on. The position of the **last digit** in the decimal indicates whether you have tenths, hundredths or thousandths.

O	t	h	th	
0	7			$= \frac{7}{10}$
1	2	1		$= \frac{121}{100}$
0	0	1	4	$= \frac{14}{1000} = \frac{7}{500}$
0	3	7	5	$= \frac{375}{1000} = \frac{75}{200} = \frac{3}{8}$

Remember that zeros on the end of a decimal are unimportant, so 0.100 is the same as 0.10 and 0.1. This means that **100 thousandths** are equal to **10 hundredths** and **1 tenth**.

Get started

- How many tenths are equal to 0.4? $\frac{4}{10}$ 
- Write 0.9 as a fraction. $\frac{9}{10}$
- True or false? 1.3 = one and three-tenths
True ☒ False ☐
- Six-hundredths of this square is turquoise. Write this as a decimal in the place value grid below. 

O	t	h
0	0	6
- Write 0.03 as a fraction. $\frac{3}{100}$
- How many hundredths is equal to 0.11? $\frac{11}{100}$
- Write $\frac{16}{100}$ as a decimal. 0.16 
- Write the next two decimals in this pattern.
0.08, 0.09, 0.10, 0.11, 0.12 , 0.13

Now try these

- How many thousandths are equal to 0.003? $0.003 = \frac{3}{1000}$
- What is seven-thousandths as a decimal? 0.007
- True or false? 4 tenths and 5 hundredths = 45 hundredths = 0.45
True ☒ False ☐
- How many thousandths are equal to 0.025? $0.025 = \frac{25}{1000}$

13 What is the missing number? $0.103 = \boxed{103}$ thousandths $= \frac{103}{1000}$

14 Write $\frac{47}{1000}$ as a decimal. 0.047

15 True or false? 1 tenth, 6 hundredths and 1 thousandth $= \frac{161}{1000} = 0.161$ True ☒ False ☐

16 Mark 0.07 and 0.14 on this line.



17 What decimal less than 1 has no ones, 1 tenth and 7 thousandths? 0.107

18 There are 1000 metres in 1 kilometre. a) What fraction of 1 kilometre is 249 metres? $\frac{249}{1000}$ km
b) What is this fraction as a decimal? 0.249 km

Challenge

19 Mark 0.604 and 0.619 on this line.

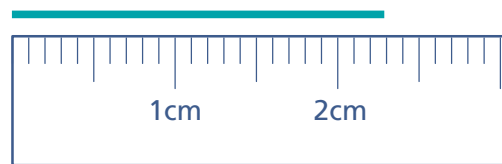


20 The line is $\frac{23}{1000}$ of a metre. Write its length using whole numbers or decimals:

a) in millimetres. 23 mm

b) in centimetres. 2.3 cm

c) in metres. 0.023 m



21 Circle the decimal that is equal to $\frac{17}{10}$. 0.17 0.017 **1.7**

22 What fraction of a metre is 0.75m? Give your answer with the denominator 4. $\frac{3}{4}$ m

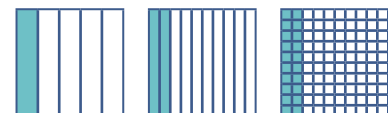
23 In a school there are 1000 children. 489 of the children are girls. As a decimal, what proportion of all the children are:

a) girls? 0.489 b) boys? 0.511



24 How many thousandths must be added to 0.999 to make 1 whole? $0.999 + \frac{1}{1000} = 1$

25 Fill in the missing numbers. $\frac{1}{5} = \frac{2}{10} = \frac{20}{100} = 0.2 = 0.20$


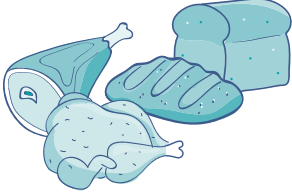


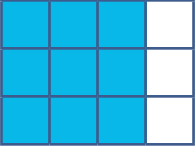



26 Reuben says that $\frac{9}{10}$ m is equivalent to $\frac{90}{100}$ m. Is he correct? Yes ☒ No ☐

27 Fill in the missing numbers. $0.80 = \frac{80}{100} = \frac{8}{10} = \frac{4}{5}$

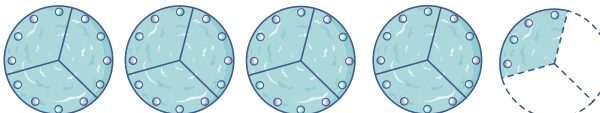
28 Write 0.125 as a fraction with the denominator 8. $\frac{125}{1000} = \frac{5}{40} = \frac{1}{8}$

Check-up test 2

- 1 Use < or > to show which fraction is larger. $\frac{6}{8}$ $\frac{7}{8}$ ☐ 1 mark
- 2 Laura's red mug holds $\frac{7}{10}$ litres and her blue mug holds $\frac{77}{100}$ litres. Which mug holds more? the blue mug  ☐ 1 mark
- 3 Charlie went shopping. He spent $\frac{4}{12}$ of his money in the butcher's and $\frac{1}{4}$ of his money in the baker's. In which shop did he spend more? the butcher's  ☐ 1 mark
- 4 Order these fractions from largest to smallest. $\frac{9}{16}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{9}{16}$ ☐ 1 mark
- 5 What is $\frac{7}{10}$ of 50ml? 35 ml ☐ 1 mark
- 6 A full turn is 360° . How many degrees in $\frac{2}{6}$ of a full turn? 120 $^\circ$  ☐ 1 mark
- 7 Ali draws a line that is $\frac{5}{8}$ the length of line A. How long is Ali's line? 15 cm  ☐ 1 mark
- 8 $\frac{1}{30}$ of an hour is 2 minutes. What fraction of an hour is 14 minutes? $\frac{7}{30}$ hr ☐ 1 mark
- 9 Find four lots of $\frac{1}{5}$. $\frac{4}{5}$ ☐ 1 mark
- 10 Colour $\frac{3}{12} \times 3$ on the grid.  ☐ 1 mark
- 11 Write the answer to $4 \times \frac{3}{5}$ as an improper fraction. $\frac{12}{5}$  ☐ 1 mark
- 12 Write the answer to $9 \times \frac{3}{10}$ as a mixed number. $2\frac{7}{10}$ ☐ 1 mark

- 13** Ellie's stride measures $\frac{4}{5}$ m. What is the length of 9 of her strides?
Give your answer as a mixed number. $7\frac{1}{5}$ m

☐
1 mark

- 14** $4\frac{1}{3} \times 2 = (4 \times 2) + (\frac{1}{3} \times 2) =$ $8\frac{2}{3}$ 

☐
1 mark

- 15** Write the answer to $5 \times 1\frac{7}{10}$ as a mixed number. $8\frac{5}{10}$ Also accept $8\frac{1}{2}$

☐
1 mark

- 16** A bottle holds $1\frac{1}{4}$ litres. How much less than 17 litres do 13 bottles hold? $\frac{3}{4}$ l

☐
1 mark

- 17** What is 7.6 rounded to the nearest whole number? 8

☐
1 mark

- 18** Give 4.38 as a decimal rounded to the nearest tenth. 4.4

☐
1 mark

- 19** Round 8.52 to the nearest whole number. 9

☐
1 mark

- 20** What is the smallest decimal with two decimal places that, when rounded to the nearest tenth, is 3.4? 3.35

☐
1 mark

- 21** How many tenths are equal to 0.6?

$0.6 =$ $\frac{6}{10}$ 

☐
1 mark

- 22** What is nine-thousandths as a decimal? 0.009

☐
1 mark

- 23** Write $\frac{74}{1000}$ as a decimal. 0.074

☐
1 mark

- 24** 1000 children attend a classical musical concert. 624 of the children are girls.
As a decimal, what proportion of all the children are:

- a) girls? 0.624
b) boys? 0.376



☐
1 mark

Total

24 marks

Compare decimals with up to three decimal places

Key point

When comparing decimals, remember that tenths are larger than hundredths and hundredths are larger than thousandths. Compare the digits from left to right.

O	t	h	th
0	0	8	6
0	1	2	5

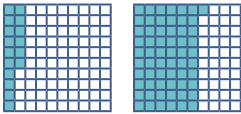
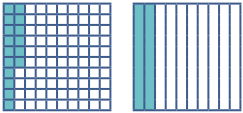
0.125 is larger than 0.086.

$0.125 > 0.086$

It can help to write zeros on the end of decimals so that the decimals being compared have the same number of decimal places. This makes them easier to compare.

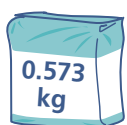
$0.94 > 0.913$ can be written as $0.940 > 0.913$

Get started

- Which is greater:
0.16 or 0.61? 0.61 
- Which is greater: 0.24 or 0.42? 0.42
- Circle the larger amount of money.
£0.30 £0.03
- Put the decimals in order from smallest to largest. 0.74 0.80 0.79
0.74 0.79 0.80
- Use < or > to show which is larger.
0.837 < 0.983
- Given that 0.2 is equal to 0.20, circle the larger number.
0.16 0.2 
- Circle the tenths digit in each of these decimals. 0.7 0.69
- Which of these two numbers has more tenths: 0.7 or 0.69? 0.7

Now try these

- Circle the larger number: 0.7 0.69
- Which is the shorter length: 0.99m or 0.9m? 0.9 m
- Which is smaller: 0.5 or 0.51? 0.5
- Freddie says that, because 7.6 and 7.60 are the same number, then 7.6 is larger than 7.58. Is he correct?
Yes ☒ No ☐
- Write the weights of these bags in order from lightest to heaviest.



0.357 kg 0.375 kg 0.537 kg 0.573 kg 0.735 kg 0.753 kg

- 14 Circle the larger number. 0.582 0.61
- 15 Use $<$ or $>$ to show which is larger. 0.99 $>$ 0.818
- 16 True or false? 0.912 is greater than 0.8. True ☒ False ☐
- 17 Write a number with two decimal places that lies between 0.469 and 0.471. 0.47
- 18 True or false? $0.685 < 0.69$ True ☒ False ☐

Challenge

- 19 Three potatoes each weigh 0.096kg, 0.13kg and 0.2kg.
What is the weight of the heaviest potato? 0.2 kg
- 20 True or false? $0.625 > 0.75 > 0.375$ True ☐ False ☒
- 21 Here are the race times of three runners. Tick the fastest time.
22.463 seconds ☒ 22.47 seconds ☐ 22.5 seconds ☐



- 22 Put these decimals in order from smallest to largest.
0.5 0.551 0.55 0.05 0.005 0.005 0.05 0.5 0.55 0.551

- 23 The River Caiton is 0.64km at its widest point. The River Kean is 0.594km at its widest point.
Which is the wider river? River Caiton

- 24 Some athletes are doing the long jump. The distances jumped are shown below.
Kate 7.3m Lucy 6.87m Noah 7.02m Luke 6.9m
Put the jumps in order from smallest to largest.

6.87 m 6.9 m 7.02 m 7.3 m



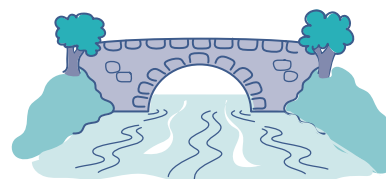
- 25 What is the smallest decimal with three decimal places that is greater than the number 3? 3.001

- 26 Maya puts some capacities in order, from least to most, but has made one mistake.
Cross out the capacity that is in the wrong place.



- 27 There are two bridges across part of a river. The first bridge is 24.53m long and the second bridge is 24.5m long. How much longer is the first bridge than the second bridge? Give your answer:

a) in metres. 0.03 m b) in centimetres. 3 cm



- 28 What is the missing digit? $0.75 < \frac{4}{5} < 0.825$

Solve problems with decimals up to three decimal places

Key point

When adding and subtracting decimals, **line up the decimal points** so that you add thousandths to thousandths, hundredths to hundredths, and tenths to tenths.

	O	t	h	th
	0	4	0	
+	0	3	7	
=	0	7	7	

	O	t	h	th
	0	4 ³	10 ⁹	1 ⁰
-	0	3	7	5
=	0	0	2	5

It can help to write zeros on the end of decimals so that the decimals being added or subtracted have the same number of decimal places. This makes them easier to add or subtract.

Get started

- 1 Mark a cross on the ruler to show 1.8cm.



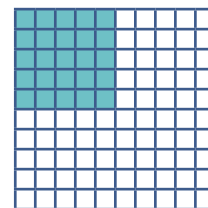
- 2 Write $3\frac{7}{10}$ cm as a decimal. 3.7 cm

- 3 What is the sum of £0.50 and £0.06?
£ 0.56

- 4 How many tenths are equal to three-tenths plus seven-tenths? 10 tenths

- 5 What is $1.3 + 0.7$? 2 or 2.0

- 6 Write $\frac{1}{4}$ as a decimal.
0.25



- 7 True or false? $3\frac{1}{100}$ m = 3m and 1cm = 3.01m
True ☒ False ☐

- 8 0.9kg + 0.2 kg = 1.1kg

Now try these

- 9 How many quarters of a kilogram are in 0.75 kilograms? 3 quarters

- 10 0.7kg of flour and some sugar are put into a bowl.
The flour and sugar together weigh 1.2kg.

How much sugar is there? 0.5 kg



- 11 Has this calculation been done correctly?

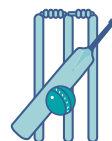
	0	.	4
+	3	.	4
	3	.	4
			6

Yes ☐ No ☒

- 12 Add 4.15km and 3.62km. 7.77 km

- 13 What is the difference between 0.8m and 0.75m? 0.05 m

- 14 In a game of cricket, Aiden hits the ball 4.9m and Ahmed hits it 5.6m. How much further does Ahmed hit the ball than Aiden? 0.7 m



- 15 Each of Mia's steps is 0.4m apart when she walks. If she takes three steps, how far from the start has she walked? 1.2 m



- 16 Some athletes are doing the long jump. Here are the distances each jumps.

Ollie 4.74m Jon 4.69m Carl 4.7m

- a) How much further does Ollie jump than Jon? 0.05 m
 b) How much further does Ollie jump than Carl? 0.04 m
 c) How much further does Carl jump than Jon? 0.01 m

- 17 Find the total mass of these three parcels. 4.875 kg



- 18 Some square tiles have sides that are each 0.55m. How long is a line of three touching tiles, in metres? Give your answer as a decimal. 1.65 m

Challenge

- 19 Put a decimal point in each of these numbers so that the value of the 4 is 4 ones.

6 5 4.3 2 4.9 6 4.2 6 7

- 20 Now find the sum of the three numbers you made in question 19. 683.527

- 21 Find the difference between $(4.0 + 6.0)$ and $(0.4 + 0.6)$. 9

- 22 Write the decimal that is halfway between 0.4 and 0.38. 0.39

- 23 0.9 0.01 0.25 0.09 0.75

Look at the decimals above. Which two of these decimals when added together equal:

- a) one whole? 0.25 and 0.75 b) one-tenth? 0.01 and 0.09

- 24 Write the difference between 0.1 and a half as a decimal. 0.4

- 25 0.3km 0.15km 0.09km 1.1km 0.999km

Look at the lengths above. Add the shortest length to the longest length. 1.19 km

- 26 How much more does the white tin hold than the turquoise tin?

Give your answer: a) in litres. 0.037 l b) in millilitres. 37 ml



- 27 What is 0.2°C minus 0.6°C ? -0.4 $^{\circ}\text{C}$



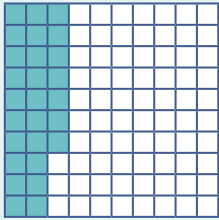
- 28 A rectangle has a length of 0.4m and a width that is 5cm less than its length. What is the perimeter of the rectangle? 1.5 m

Understand percentages as fractions

Key point

%

This is the **percentage symbol**. The **percentage symbol** stands for 'per cent' which means 'out of 100'. So 27% means '27 out of 100' or $\frac{27}{100}$ or 27 hundredths.



27% of the grid is turquoise.

73% of the grid is white.

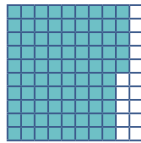
100% is the whole of the grid.

Get started

- 1 True or false? 38% means $\frac{38}{100}$.
True ☒ False ☐

- 2 Write 49% as a fraction with the denominator 100. $\frac{49}{100}$

- 3 85 out of these 100 squares are turquoise. What percentage is turquoise? 85%



- 4 What percentage is equal to $\frac{59}{100}$?
Remember to include the percentage symbol. 59%

- 5 Fill in the missing percentage.
 $\frac{70}{100} =$ 70 %

- 6 If 95% of a shape is purple, what percentage is not purple? 5%

- 7 $\frac{6}{100} =$ 6 %

- 8 Given that $\frac{1}{2} = \frac{50}{100}$, what is $\frac{1}{2}$ as a percentage? 50%

Now try these

- 9 61% of the people at a concert were adults. What percentage were children? 39%

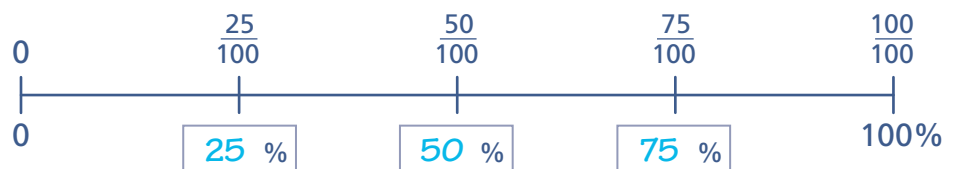
- 10 Seventy-three out of one hundred cards in a shop are birthday cards. Write this as a fraction and as a percentage. $\frac{73}{100} =$ 73 %

- 11 In a cinema there are 100 seats. 42% of the seats are empty. What percentage of the seats are not empty? 58%

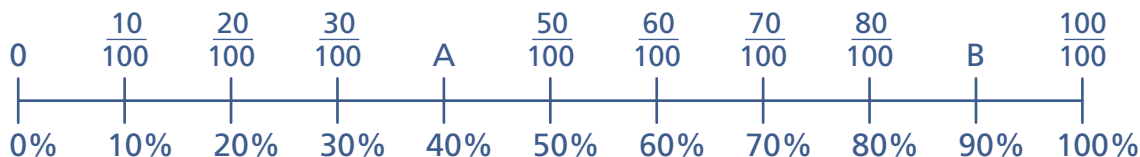


- 12 True or false? $30\% + 70\% = 100\% = 1$ whole True ☒ False ☐

- 13 Fill in the missing numbers.



- 14** Write A and B as fractions with the denominator 100. $A = \frac{40}{100}$ $B = \frac{90}{100}$



- 15** True or false? If Katya has used 50% of the cream in a 100ml pot, she has used half of the cream.
True ☒ False ☐

- 16** Alfie has a full jug of milk. He pours 40% of it into a cup.
What percentage of the jug is filled now? 60%

- 17** Adele gives 11% of her wages to her son, 19% to her daughter and spends the rest herself. What percentage does she spend herself? 70%



- 18** What percentage of one metre is 15cm? 15%

Challenge

- 19** What percentage of a pound is 36p? 36%

- 20** In a sports club there are 100 children. 54 of them play football.
What percentage of the children do not play football? 46%



- 21** Hamed pours 20ml squash and 80ml water into a glass.
What percentage of the whole drink is squash? 20%

- 22** What is the missing percentage on this clothing label?
No other materials are used. 53%



- 23** Fill in the missing numbers.

$$\frac{3}{4} = \frac{75}{100} = 75\%$$

- 24** A vase can hold 400ml. How many millilitres can 25% or $\frac{1}{4}$ of the vase hold? 100 ml



- 25** Ethan gives 10% of his money to charity each week.
If he earns £100 a week, how much does he give to charity each week? £ 10

- 26** Use equivalent fractions to help you write 20% as a fraction with the denominator 5. $\frac{1}{5}$

- 27** The decimal 0.38 is equivalent to the fraction $\frac{38}{100}$.
Is it true that the percentage 38% is equivalent to the decimal 0.38?

Yes ☒ No ☐

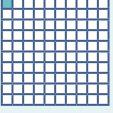
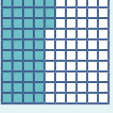
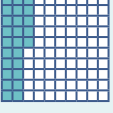
- 28** Write these fractions as percentages.

$$\frac{7}{10} = \frac{?}{100} = 70\% \quad \frac{4}{5} = \frac{?}{100} = 80\% \quad \frac{7}{20} = \frac{?}{100} = 35\%$$

Understand percentages as fractions and as decimals

Key point

Proportions of a whole can be written as percentages, as decimals or as fractions.

		percentage	decimal	fraction
	1 hundredth	1%	0.01	$\frac{1}{100}$
	43 hundredths	43%	0.43	$\frac{43}{100}$
	25 hundredths	25%	0.25	$\frac{25}{100}$ or $\frac{1}{4}$

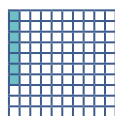
Get started

1 True or false? $3\% = \frac{3}{100} = 0.03$

True ☒ False ☐

2 Write 7% as a fraction and as a decimal.

$7\% = \frac{7}{100} = 0.07$

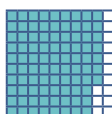


3 What percentage is equal to 0.5 or $\frac{1}{2}$?

50%

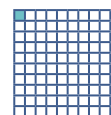
4 Write 87 hundredths as a fraction, as a decimal and as a percentage.

$\frac{87}{100} = 0.87 = 87\%$



5 True or false? $1\% = 0.1$

True ☐ False ☒



6 Fill in the missing percentage.

$\frac{20}{100} = 20\%$

7 What is 20% as a decimal? 0.2

8 Given that $25\% = \frac{1}{4}$, what is 25% as a decimal? 0.25



Now try these

9 How can 13 hundredths be written as a fraction, as a decimal and as a percentage?

a) fraction $\frac{13}{100}$ b) decimal 0.13 c) percentage 13%

10 Tom says that 0.3 is equivalent to 0.30, so 0.3 is equivalent to 30%. Is he correct? Yes ☒ No ☐

11 Fill in the percentage. $0.9 = \frac{9}{10} = \frac{?}{100} = 90\%$

12 True or false? 75 hundredths of £1 = 75% of £1 = 75p = £0.75 True ☒ False ☐

13 What percentage of a pound is £0.15? 15%

- 14** Write the length that is 61% of one metre as a decimal. 0.61 m
- 15** Write the answer to the question $0.25 + 0.25$ as: a) a decimal. 0.5
b) a percentage. 50% c) a fraction. $\frac{50}{100}$ Also accept $\frac{5}{10}$ or $\frac{1}{2}$
- 16** What percentage of a metre is 0.34m? 34%
- 17** The chef poured 0.8l of gravy into a litre jug. Tick the true statements.
 $\frac{8}{10}$ of the jug is filled. ☒ 80% of the jug is filled. ☒
 8% of the jug is filled. ☐ The jug is 20% empty. ☒
- 18** As a percentage, write what proportion £9 is of £100. 9%



Challenge

- 19** Circle any that are equal to 17%. 0.17 0.017 $\frac{17}{10}$ $\frac{17}{100}$ 1.7
- 20** Circle the largest proportion. 50% $\frac{3}{4}$ 0.8 19%
- 21** True or false? $\frac{1}{5} = 5\%$ True ☐ False ☒
- 22** Circle all the proportions that are equivalent to 20%.
 $\frac{5}{100}$ 0.5 $\frac{20}{100}$ 0.005 0.2 $\frac{2}{10}$ 0.02 $\frac{1}{5}$
- 23** Find the total mass of these two packets.
 Write the answer as a percentage of a kilogram. 90%
- 24** Ruby scored 132 out of 200 in a test.
 Write this as a fraction with the denominator of 100 and then as a percentage.
 a) fraction $\frac{66}{100}$ b) percentage 66%
- 25** Imogen scored 11 out of 25 in a test.
 What is this as a fraction with the denominator of 100, as a percentage and as a decimal?
 a) fraction $\frac{44}{100}$ b) percentage 44% c) decimal 0.44
- 26** Rakesh notices that converting from percentages to decimals is the same as dividing by 100.
 So 54% is equal to the decimal made by dividing 54 by 100 = 0.54.
 Use his method to write 13.5% as a decimal. 13.5% = 0.135
- 27** The number of rabbits in a forest more than doubles in one year. It increases by 105%.
 Write this increase as a decimal. 1.05
- 28** A right angle (90°) is a quarter of a full turn. An angle of 45° is half a right angle.
 What percentage of a full turn is an angle of 45° ? Circle the answer.
 25% 75% 15% 10% $12\frac{1}{2}\%$



Relate percentages to 'finding fractions of'

Key point

$$50\% = \frac{50}{100} = \frac{1}{2}$$

So, to find 50% of a number, divide by **2**.

$$50\% \text{ of } 12\text{m} = 6\text{m}$$

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

So, to find 25% of a number, divide by **4**.

$$25\% \text{ of } 40\text{p} = 10\text{p}$$

$$10\% = \frac{10}{100} = \frac{1}{10}$$

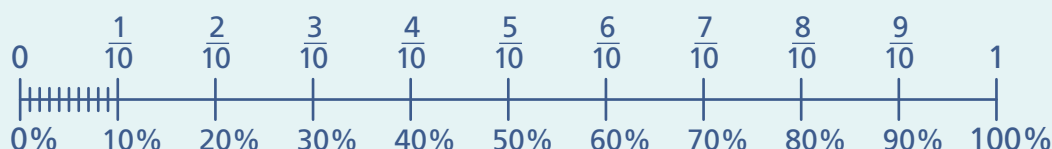
So, to find 10% of a number, divide by **10**.

$$10\% \text{ of } 30\text{kg} = 3\text{kg}$$

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

So, to find 1% of a number, divide by **100**.

$$1\% \text{ of } £400 = £4$$



Get started

- 1** Given that $50\% = \frac{1}{2}$, find 50% of £8.
£ 4



- 2** True or false? 50% of 12 is 24.
True ☐ False ☒

- 3** Given that $25\% = \frac{1}{4}$, find 25% of 20p.
5 p



- 4** What is 50% of 50ml? 25 ml

- 5** Find 25% of 40km. 10 km

- 6** What is 10% of 50kg? 5 kg

- 7** What is ten per cent of sixty?
Write the answer in words.

six

- 8** Find 1% of 700m. 7 m

Now try these

- 9** 1 hundredth of 120m is 1.2m. What is 1% of 120m? 1.2 m

- 10** Find the total of 1% of 500 and 10% of 30. 8

- 11** Hamish draws a line that is 10% of the length of line A.
How long is Hamish's line? 7 mm

Line A
_____ mm
70mm

- 12** Fill in the missing percentage. 50 % of 200m = 100m

- 13** Luca draws a line that is 10% longer than line B.
How long is Luca's line? 33 cm

Line B
_____ cm
30cm

- 14** A full turn is 360° . How many degrees are there in 25% of a full turn? 90 °

15 25% is one-quarter of a whole. What percentage is three-quarters of a whole? 75%

16 Find the difference between 25% of 36kg and 10% of 90kg. 0 kg

17 Zainab takes 25% of the money in each bag.
How much does she take in total? £ 19



18 There are 30 children in a class. How many of the children are girls if:

a) 10% are girls? 3 b) 20% are girls? 6 c) 30% are girls? 9

Challenge

19 $\frac{4}{5} = 80\%$ Use this fact to help you answer the question.

How much less than 4m is 80% of 400cm? 80 cm

20 10% of £270 20% of £150 1% of £3200

What is the value of: a) the largest of these amounts? £ 32

b) the smallest of these amounts? £ 27 c) the total of these amounts? £ 89

21 Dylan is 90% of the height of his brother. His brother is 120cm tall.
How tall is Dylan? 108 cm



22 20% of an hour is 12 minutes.

What percentage of an hour is 36 minutes? 60%

23 True or false? 1% of 400g is 4g, so 9% of 400g is 36g. True ☒ False ☐

24 Find 9% of 700g and add it to 75% of 400g. 363 g

25 Rose earns £32 000 per year. She pays 25% of the money in tax and 10% into her pension.
How much money does she have left? £ 20 800

26 Abigail finds 50%, 25%, 10% and 1% of 8400.
She then adds her answers to find 86% of 8400. What is her answer? 7224

27 At a basketball match 90% of the people are adults. If there are 120 children,
how many people are there altogether at the match? 1200

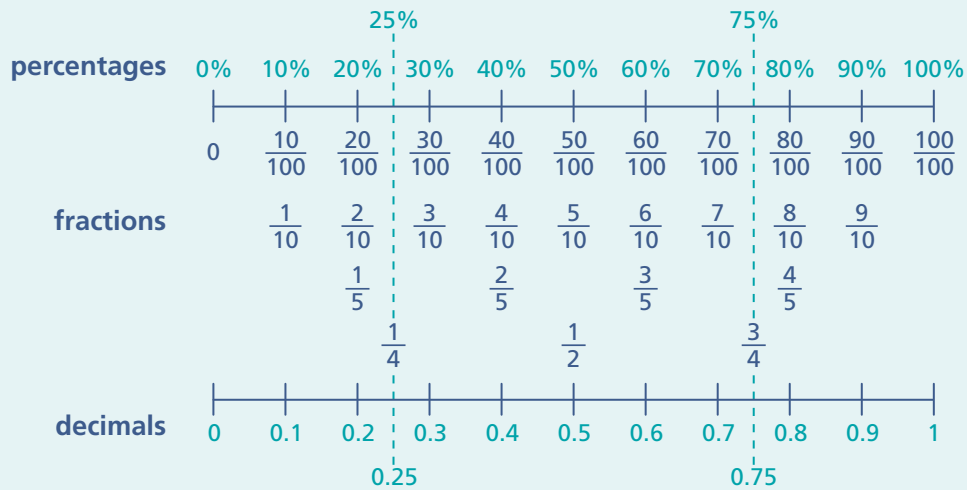


28 The width of a rectangle is 40% of its length. Its length is 80mm.
Find the perimeter of the rectangle in centimetres. 22.4 cm

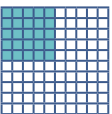
Solve fraction, decimal and percentage problems

Key point



Proportions of a whole can be described as fractions, as decimals and as percentages. Sometimes it is easier to work with fractions, at other times it is easier to work with percentages or decimals.



Get started

- Use the fact that 50% is one-half to help you find 50% of 400ml. 200 ml
- Write $\frac{1}{4}$ as a decimal. 0.25 
- How many lots of 0.25m are in one whole metre? 4
- Jade scored 9 out of 10 in a test. What is this score as a percentage? 90%
- Find 25% of 80km. 20 km
- How many lots of 0.1m are in 2m? 20
- True or false? $\frac{37}{100}$ m = 37cm = 0.37m
True ☒ False ☐
- What proportion of £100 is £93? Write the answer as a percentage. 93%

Now try these

- What fraction of a litre is the total amount in these two tubs? $\frac{3}{4}$ or $\frac{75}{100}$ l 
- How many tenths of a kilogram are equivalent to 70% of a kilogram? 7 tenths
- Fill in the missing numbers in the two sequences.
a) 5%, 10%, 15%, 20%, 25%, 30%, 35% b) 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35
- Sam scores 73 out of 100 in a test. Julia scores 72% on the same test.
Who has the higher score? Sam
- How long is a line that is 50% of the length of a line measuring 80mm? 40 mm
- What percentage of a whole turn is a right angle? 25% 

15 0.35kg of flour and 0.15kg sugar are put into a bowl.
What fraction of a whole kilogram do they weigh in total? $\frac{1}{2}$ or $\frac{50}{100}$ kg

16 Six minutes is equal to one-tenth of an hour.
What percentage of an hour is 18 minutes? 30%



17 A motorcyclist travels for 4.15km before taking a break and then goes 3.8km after the break.
How much further does he need to go to have travelled 8km altogether? 0.05 km

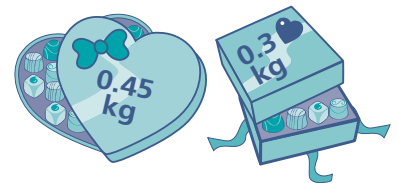
18 Find the difference in kilograms between 25% of 32kg and $\frac{1}{10}$ of 160kg. 8 kg

Challenge

19 Find the total mass of these two boxes of chocolates. Write the answer as:

a) a percentage of a kilogram. 75%

b) a fraction of a kilogram. $\frac{3}{4}$ kg Also accept $\frac{15}{20}$ or $\frac{75}{100}$



20 Erin is $\frac{7}{10}$ of the height of her brother. Her brother is 110cm tall. How tall is Erin? 77 cm

21 Al earns £20 000 per year. He pays 30% of the money in tax.
How much money does he pay in tax? £ 6000

22 In a test Aswin scored 243 out of 300. Write this as a fraction with a denominator of 100 and then as a percentage. a) fraction $\frac{81}{100}$ b) percentage 81%

23 What is the score $\frac{44}{50}$ as a percentage? 88%

24 Meema takes out 10% of the money in her savings account. She takes out £17.
How much money: a) does she have in total? £ 170 b) is left in the savings account now? £ 153

25 A can of cola holds 0.3 litres and a bottle of cola holds 55% of a litre. Find the difference between the amounts of cola in each. Write the answer as a fraction of a litre. $\frac{1}{4}$ l

26 A nurse is giving some medicine to a child. The child's dose is 60% of the adult's dose. If the adult's dose is 80ml, what is the child's dose? 48 ml



27 Write 870g of 1kg as: a) a fraction. $\frac{87}{100}$ b) a percentage. 87% c) a decimal. 0.87

28 This chart shows the number of children who passed their cycling proficiency test at three schools.

	Mickleby School	St James School	Deansgate School
number of children	100	200	500
number of passes	87	184	450

Write each school's number of passes as a percentage of the number of children.

a) Mickleby 87% b) St James 92% c) Deansgate 90%

Check-up test 3

1 Circle which is more. 0.36 0.63

☐

1 mark

2 Which of these two numbers has more tenths? Circle it. 0.351 0.42

☐

1 mark

3 True or false? 0.704 is greater than 0.8.

True ☐ False ☒

☐

1 mark

4 Ruth jumps 1.7m in the high jump and Will jumps 1.63m.
How much higher does Ruth jump than Will? Give your answer:

a) in metres. 0.07 m b) in centimetres. 7 cm


☐

1 mark

5 How many tenths are equal to four-tenths plus two-tenths?

Write the answer in fraction notation. $\frac{6}{10}$

☐

1 mark

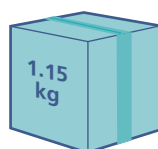
6 Add 3.42km and 5.37km. 8.79 km

☐

1 mark

7 Find the total mass of these three parcels.

4.625 kg


☐

1 mark

8 What decimal is halfway between 0.52 and 0.5? 0.51

☐

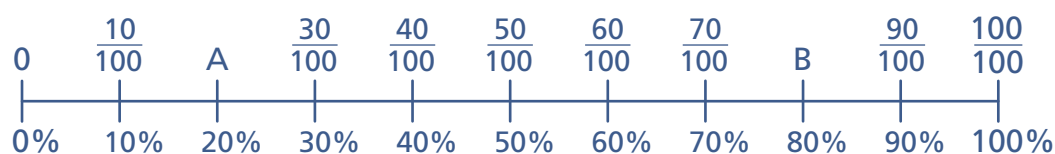
1 mark

9 If 85% of a shape is shaded, what percentage is not shaded? 15%

☐

1 mark

10 Write A and B as fractions with the denominator 100.



A = $\frac{20}{100}$ B = $\frac{80}{100}$

☐

1 mark

11 What percentage of one metre is 35cm? 35%

☐

1 mark

12 Use equivalent fractions to help you write 60%
as a fraction with the denominator 5. $\frac{3}{5}$

☐

1 mark

13 What is 80% as a decimal? 0.8

☐
1 mark

14 True or false? 25 hundredths of £1 = 25% of £1 = 25p = £0.25

True ☒ False ☐

☐
1 mark

15 Meg pours 0.4 litres of milk into a litre jug. Tick the true statements.

$\frac{4}{10}$ of the jug is filled. ☒

4% of the jug is filled. ☐

40% of the jug is filled. ☒

The jug is 60% empty. ☒



☐
1 mark

16 Circle the largest proportion. 60% $\frac{3}{4}$ 0.7 49%

☐
1 mark

17 Find 25% of 60km. 15 km

☐
1 mark

18 Dinesh draws a line that is 10% longer than line A.

How long is Dinesh's line? 55 cm

Line A
50cm

☐
1 mark

19 Find the difference in kilograms between 25% of 24kg and 10% of 70kg. 1 kg

☐
1 mark

20 40% of an hour is 24 minutes.

What percentage of an hour is 48 minutes? 80%

☐
1 mark

21 What proportion of £100 is £86?

Write the answer as a percentage. 86%

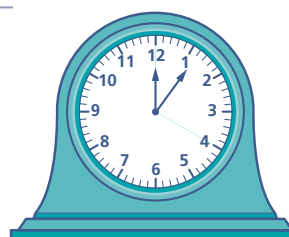
☐
1 mark

22 Dan scores 54 out of 100 in a dance competition. Louise scores 56% in the same competition. Who has the higher score? Louise

☐
1 mark

23 Six minutes is equal to one-tenth of an hour.

What percentage of an hour is 36 minutes? 60%



☐
1 mark

24 A mother is giving some medicine to her child.

The child's dose is 70% of the adult's dose.

If the adult's dose is 60ml, what is the child's dose? 42 ml

☐
1 mark

Total

24 marks

Final test

Section 1

1 Use < or > to show which is larger. $\frac{6}{10}$ $\frac{4}{5}$

☐
1 mark

2 Change these fractions to twentieths.
Then write the original fractions in order from smallest to largest.

$\frac{7}{10}$ $\frac{3}{5}$ $\frac{13}{20}$ $\frac{3}{5}$ $\frac{13}{20}$ $\frac{7}{10}$

☐
1 mark

3 Write these fractions in order, smallest first.

$\frac{3}{10}$ $\frac{1}{5}$ $\frac{17}{100}$ $\frac{17}{100}$ $\frac{1}{5}$ $\frac{3}{10}$

☐
1 mark

Section 2

4 How many twelfths are equivalent to $\frac{3}{4}$? 9 twelfths



☐
1 mark

5 Fill in the missing number to show an equivalent fraction.

$\frac{18}{21} = \frac{6}{7}$

☐
1 mark

6 $\frac{2}{5} = \frac{4}{10} = \frac{40}{100}$



☐
1 mark

Section 3

7 Write the answer as a mixed number. $\frac{4}{7} + \frac{4}{7} = 1 \frac{1}{7}$

☐
1 mark

8 Write this improper fraction as a mixed number. $\frac{17}{5} = 3 \frac{2}{5}$

☐
1 mark



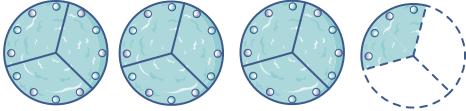
9 Write this mixed number as an improper fraction. $4 \frac{4}{7} = \frac{32}{7}$

☐
1 mark

Section 4

- 10** Answer these. a) $\frac{3}{9} + \frac{5}{9} + \frac{5}{9} = \frac{13}{9}$ or $1 \frac{4}{9}$ b) $\frac{17}{12} - \frac{10}{12} = \frac{7}{12}$ ☐ 1 mark
- 11** Fill in the missing numbers.
 $\frac{3}{10} + \frac{5}{100} = \frac{30}{100} + \frac{5}{100} = \frac{35}{100}$ ☐ 1 mark
- 12** Find the total of $\frac{3}{4} + \frac{3}{20}$. $\frac{18}{20}$ Also accept $\frac{9}{10}$ ☐ 1 mark

Section 5

- 13** Mark the answer to $\frac{3}{10} \times 4$ on this number line.
 ☐ 1 mark
- 14** $1 \frac{1}{4} \times 7 = 8 \frac{3}{4}$
 ☐ 1 mark
- 15** $3 \frac{1}{3} \times 6 = (3 \times 6) + (\frac{1}{3} \times 6) = 20$
 ☐ 1 mark

Section 6

- 16** Write 0.7 as a fraction. $\frac{7}{10}$ ☐ 1 mark
- 17** Write 0.73 as a fraction. $\frac{73}{100}$ ☐ 1 mark
- 18** What fraction of a metre is 0.25m?
 Write the fraction with the lowest denominator possible. $\frac{1}{4}$ m ☐ 1 mark

please turn over

Section 7

- 19 How many thousandths are equal to 0.075?

$$0.075 = \frac{75}{1000}$$

☐
1 mark

- 20 What is the missing number?

$$0.109 = \frac{109}{1000} \text{ thousandths} = \frac{109}{1000}$$

☐
1 mark

- 21 Write $\frac{47}{1000}$ as a decimal. 0.047

☐
1 mark

Section 8

- 22 Round each decimal to the nearest whole number.

a) 0.6 1

b) 3.4 3

c) 7.47 7

☐
1 mark

- 23 Round each decimal to the nearest tenth (to one decimal place).

a) 0.63 0.6

b) 3.45 3.5

c) 7.97 8.0

☐
1 mark

- 24 Circle all the decimals that round to 6.0 when rounded to the nearest tenth.

5.98 5.91 6.20 6.31 6.06 6.02

☐
1 mark

Section 9

- 25 Circle the larger number. 0.58 0.6

☐
1 mark

- 26 Use < or > to show which is larger. 0.91 > 0.908

☐
1 mark

- 27 Put these decimals in order from smallest to largest.

0.3 0.331 0.33 0.03 0.003

0.003 0.03 0.3 0.33 0.331

☐
1 mark

Section 10

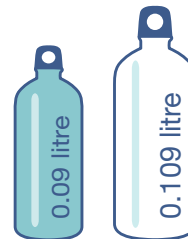
- 28** Add 0.7km and 1.6km. 2.3 km

- 29** Find the total mass of these three bags.
4.875 kg



- 30** How much more does the white bottle hold than the turquoise bottle?

Give your answer: a) in litres. 0.019 l
b) in millilitres. 19 ml



☐
1 mark

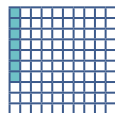
☐
1 mark

☐
1 mark

Section 11

- 31** Write 7% as a fraction and then as a decimal.

$$7\% = \frac{7}{100} = 0.07$$



- 32** Circle those that are equal to 59%. 0.59 0.059 $\frac{59}{10}$ $\frac{59}{100}$ 5.9

- 33** Write this as a percentage and as a decimal. $\frac{4}{5} = \frac{?}{100}$
a) percentage 80% b) decimal 0.8

☐
1 mark

☐
1 mark

☐
1 mark

Section 12

- 34** Find 25% of 44km. 11 km

- 35** 0.35kg of flour and 0.15kg sugar are put into a bowl.
What percentage of a kilogram do they weigh in total? 50%



- 36** Emily is 80% of the height of her brother.
Her brother is 120cm tall. How tall is Emily? 96 cm

☐
1 mark

☐
1 mark

☐
1 mark

Total

36 marks

End of test