

Dividing fractions and mixed numbers

Year 8 About 65 minutes No calculator 48 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-8-dividing-fractions-and-mixed-numbers/

Date _____

A Do Now

Quick questions to start.

A1 Needed today [1 mark]
 Write $3\frac{3}{4}$ as an improper fraction.

Answer _____

A2 Needed today [1 mark]
 Work out $\frac{4}{9} \times \frac{3}{10}$.

Answer _____

A3 Last lesson [1 mark]
 Work out $2\frac{1}{3} \times 1\frac{1}{5}$.

Answer _____

A4 From chapter 1 [1 mark]
 A coat costs £60. Its price falls by 15%. Work out the new price.

Answer _____

B Example, then your turn

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Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1Write down the reciprocal of (a) 7 (b) $\frac{5}{9}$ (c) $2\frac{3}{8}$.

Hint Swap the top and the bottom. A whole number is a fraction over 1; a mixed number must be made improper first.

B1 Write down the reciprocal of [2 marks](i) $\frac{3}{11}$ (ii) $4\frac{2}{5}$.

Answer (i) (ii)

EXAMPLE 2Work out $\frac{5}{6} \div \frac{2}{9}$.

Hint Keep the first fraction. Multiply by the reciprocal of the second: $\frac{9}{2}$.

B2 Work out $\frac{4}{7} \div \frac{6}{35}$. [2 marks]

Answer

EXAMPLE 3Work out (a) $8 \div \frac{2}{5}$ (b) $\frac{3}{4} \div 6$.

Hint Write each whole number over 1. In (b) the reciprocal of 6 is $\frac{1}{6}$.

B3 Work out (i) $9 \div \frac{3}{7}$ (ii) $\frac{5}{8} \div 10$. [2 marks]

Answer (i) (ii)

EXAMPLE 4

Work out $3\frac{1}{3} \div 1\frac{7}{8}$.

Hint Change both to improper fractions, then multiply by the reciprocal of $\frac{15}{8}$.

B4

Work out $4\frac{1}{2} \div 2\frac{5}{8}$.

[2 marks]

Answer

EXAMPLE 5

A rectangle has an area of $8\frac{3}{4} \text{ m}^2$. It is $2\frac{1}{3} \text{ m}$ wide. How long is it?

$2\frac{1}{3} \text{ m}$

area $8\frac{3}{4} \text{ m}^2$

?

Not drawn accurately

Hint Area = length $\times$ width, so length = area $\div$ width.

B5

A rectangle has an area of $9\frac{1}{3} \text{ m}^2$. It is $2\frac{2}{3} \text{ m}$ wide. How long is it?

[3 marks]

$2\frac{2}{3} \text{ m}$

area $9\frac{1}{3} \text{ m}^2$

?

Not drawn accurately

Answer

c Practice

Year 8

C1 Work out the missing number: [2 marks]

$$\square \times \frac{2}{3} = \frac{5}{6}$$

Answer

C2 Two numbers multiply to give [2 marks]

$8\frac{1}{3}$. One of them is $2\frac{1}{2}$. What is the other?

Answer

C3 How many pieces of ribbon, [2 marks]

each $\frac{3}{8} \text{ m}$ long, can be cut from $5\frac{1}{4} \text{ m}$ of ribbon?

Answer

C4 Without working it out, explain [2 marks]

why $6 \div \frac{3}{4}$ is more than 6. Then work it out.

Answer

- C5** In a sequence, each term is the term before multiplied by $\frac{3}{4}$.
One term is $3\frac{3}{8}$. Work out the two terms just before it. [2 marks]

Answer and

D Exam-style questions

GCSE Foundation

- D1** Tom works out $2\frac{1}{2} \div \frac{1}{4}$. He writes: " $\frac{5}{2} \times \frac{1}{4} = \frac{5}{8}$." [3 marks]

Tom is wrong. Explain his mistake and work out the correct answer.

Answer Correct answer

- D2** A jug holds $2\frac{1}{4}$ litres of juice. A glass holds $\frac{3}{10}$ of a litre.
(a) How many glasses can be filled completely from the jug? [2 marks]

Answer

- (b) How much juice is left in the jug after the glasses are filled? [2 marks]

Answer

Total for D2: 4 marks

- D3** A car travels $52\frac{1}{2}$ km in $\frac{3}{4}$ of an hour.
(a) Work out the average speed of the car in km per hour. [2 marks]

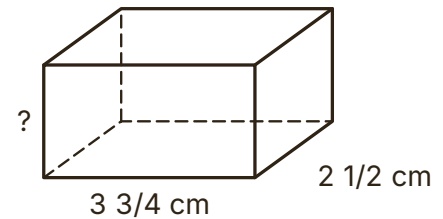
Answer

- (b) At the same speed, how long does the car take to travel $87\frac{1}{2}$ km? Give your answer in hours and minutes. [3 marks]

Answer

Total for D3: 5 marks

- D4** A cuboid has a volume of $16\frac{7}{8}$ cm³. Its base is $3\frac{3}{4}$ cm by $2\frac{1}{2}$ cm. Work out its height. [4 marks]



Answer

Not drawn accurately

- D5** Show that $4\frac{2}{3} \div 1\frac{1}{6}$ and $3\frac{1}{2} \div \frac{7}{8}$ give the same answer. [3 marks]

E Extension

Stretch

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** A positive number is divided by its own reciprocal. The answer is $6\frac{1}{4}$. What is the number? Give it as a mixed number. [4 marks]

Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1 Hint 1** Dividing by the reciprocal of a number is the same as multiplying by the number itself.
- Hint 2** So the number multiplied by itself is $\frac{25}{4}$.
- Hint 3** Find a fraction whose square is $\frac{25}{4}$: the top squared is 25 and the bottom squared is 4.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can find the reciprocal of a whole number, a fraction and a mixed number. ☐ ☐ ☐

I can divide by a fraction by multiplying by its reciprocal. ☐ ☐ ☐

I can divide mixed numbers by writing them as improper fractions. ☐ ☐ ☐

I can use dividing fractions to find lengths, speeds and how many fit. ☐ ☐ ☐