

Multiplying 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-multiplying-fractions-and-mixed-numbers/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] Write $\frac{18}{24}$ in its simplest form.
- A2** Needed today [1 mark] Write $2\frac{3}{5}$ as an improper fraction.

Answer

Answer

- A3** Last lesson [1 mark] Work out $3\frac{2}{5} + 1\frac{3}{4}$.
- A4** From chapter 6 [1 mark] A right-angled triangle has shorter sides 9 cm and 12 cm. Work out the longest side.

Answer

Answer

B Example, then your turn

Year 8

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

EXAMPLE 1

Work out (a) $\frac{9}{14} \times \frac{7}{12}$ (b) $12 \times \frac{5}{8}$.

Hint Cancel before you multiply: 9 and 12 share a factor of 3; 7 and 14 share 7. A whole number is a fraction over 1.

- B1** Work out (i) $\frac{8}{15} \times \frac{5}{12}$ (ii) $6 \times \frac{5}{8}$. [2 marks]
 Give each answer in its simplest form.

Answer (i) (ii)

EXAMPLE 2

Work out $\frac{3}{5}$ of $2\frac{1}{4}$.

Hint "Of" means multiply. Write $2\frac{1}{4}$ as an improper fraction first.

- B2** Work out $\frac{5}{6}$ of $3\frac{3}{5}$. [2 marks]

Answer

EXAMPLE 3

Work out $2\frac{1}{4} \times 1\frac{5}{6}$.

Hint Change both to improper fractions. Cancel the 9 and the 6 before you multiply.

- B3** Work out $2\frac{2}{3} \times 1\frac{4}{5}$. [2 marks]

Answer

EXAMPLE 4

Work out $\left(2\frac{1}{2}\right)^2$. Explain why the answer is not $4\frac{1}{4}$.

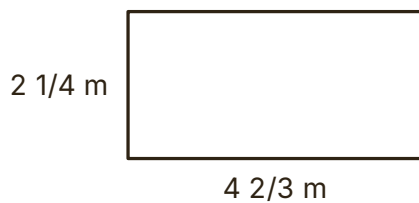
Hint Squaring means multiplying the number by itself: $\frac{5}{2} \times \frac{5}{2}$.

B4 Work out $\left(1\frac{3}{4}\right)^2 - \left(1\frac{1}{4}\right)^2$. [3 marks]

Answer

EXAMPLE 5

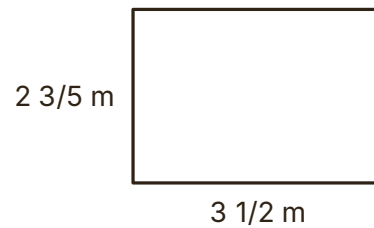
A rectangular patio is $4\frac{2}{3}$ m long and $2\frac{1}{4}$ m wide. Work out its area.



Not drawn accurately

Hint Area = length $\times$ width. Use improper fractions.

B5 A rectangular rug is $3\frac{1}{2}$ m long [3 marks] and $2\frac{3}{5}$ m wide. Work out its area.



Not drawn accurately

Answer

c Practice

Year 8

C1 Work out the missing fraction: [2 marks]
 $\frac{3}{4} \times \square = \frac{9}{20}$.

Answer

C2 Explain why $3\frac{2}{5} \times 5\frac{1}{2}$ must be [3 marks]
 more than 15 and less than 24.
 Then work it out.

Answer

C3 Work out $\frac{3}{5} \times \frac{10}{9} + \frac{1}{6}$. [2 marks]

Answer

C4 Cheese costs £6 per kilogram. [2 marks]
 Ali buys $2\frac{5}{8}$ kg. How much does he pay?

Answer

- C5** Work out $\frac{6}{7} \times \frac{14}{15} \times \frac{5}{12}$. Cancel before you multiply. [2 marks]

Answer

D Exam-style questions

GCSE Foundation

- D1** Zoe works out $3\frac{1}{2} \times 2\frac{1}{3}$. She writes: " $3 \times 2 = 6$ and $\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$, so the answer is $6\frac{1}{6}$." [3 marks]

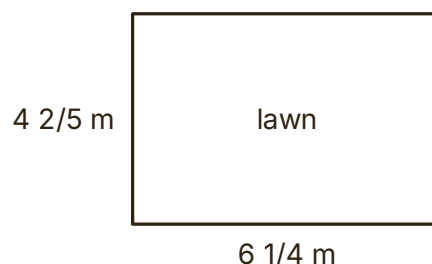
Zoe is wrong. Explain her mistake and work out the correct answer.

Answer Correct answer

- D2** A rectangular lawn is $6\frac{1}{4}$ m long and $4\frac{2}{5}$ m wide.

- (a) Work out the area of the lawn. [2 marks]

Answer



- (b) One box of grass seed covers 4 m^2 . A box costs £3.20. Work out the cost of enough boxes to cover the lawn. [3 marks]

Not drawn accurately

Answer

Total for D2: 5 marks

- D3** A recipe for 4 people uses $2\frac{1}{4}$ cups of flour.

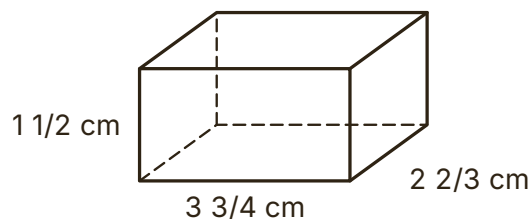
- (a) How much flour is needed for 6 people? [2 marks]

Answer

- (b) Ravi has a bag holding 5 cups of flour. Show that $3\frac{3}{8}$ cups is less than $\frac{3}{4}$ of the bag. [2 marks]

Total for D3: 4 marks

- D4 A cuboid measures $3\frac{3}{4}$ cm by $2\frac{2}{3}$ cm by $1\frac{1}{2}$ cm. Work out its volume. [3 marks]



Answer

Not drawn accurately

- D5 A cyclist rides at $12\frac{1}{2}$ km per hour for $2\frac{2}{5}$ hours. How far does she ride? [2 marks]

Answer

E Extension

Stretch

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

- E1 Which of $1\frac{2}{3}$, $1\frac{3}{4}$ and $1\frac{5}{7}$ is the best estimate for $\sqrt{3}$? Show how you decide. [4 marks]

Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1 **Hint 1** Square each fraction and see how close it is to 3.

Hint 2 $\left(1\frac{2}{3}\right)^2 = \frac{25}{9}$, $\left(1\frac{3}{4}\right)^2 = \frac{49}{16}$, $\left(1\frac{5}{7}\right)^2 = \frac{144}{49}$.

Hint 3 The gaps from 3 are $\frac{2}{9}$, $\frac{1}{16}$ and $\frac{3}{49}$. Compare $\frac{1}{16} = \frac{49}{784}$ with $\frac{3}{49} = \frac{48}{784}$.

How did it go?

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

I can multiply fractions, cancelling before I multiply. ☐ ☐ ☐

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

I can find a fraction of an amount and square a mixed number. ☐ ☐ ☐

I can use multiplying fractions to work out areas, volumes and costs. ☐ ☐ ☐