Mixed Numbers and Fractions

Practice Worksheet (Problem Solving)

I Do

Show that $3\frac{1}{5} \times 2\frac{5}{8} = 8\frac{2}{5}$

You must show all your working clearly.

(Total for Question is 3 marks)

We Do

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

You must show all your working clearly.

(Total for Question is 3 marks)

You Do 1

Show that $4\frac{1}{2} \div 1\frac{1}{5} = 3\frac{3}{4}$

You must show all your working clearly.

(Total for Question is 3 marks)

You Do 2

Show that $5\frac{1}{4} - 2\frac{5}{6} = 2\frac{5}{12}$

You must show all your working clearly.

Video walkthrough

(Total for Question is 3 marks)

You Do 3

Show that $1\frac{2}{3} \times \left(2\frac{1}{2} + 1\frac{1}{4}\right) = 6\frac{1}{4}$

You must show all your working clearly.

(Total for Question is 4 marks)

Challenge 1

Show that $2\frac{1}{4} \div \left(1\frac{1}{8} - \frac{3}{4}\right) = 6$

You must show all your working clearly.

(Total for Question is 4 marks)

Challenge 2

A rectangle has an area of $12\frac{1}{2}$ cm^2 and a width of $2\frac{1}{7}$ cm.

Show that the length of the rectangle is exactly $5\frac{5}{6}$ cm.
You must show all your working clearly.

(Total for Question is 4 marks)

Extreme Challenge

Show that $\left(3\frac{3}{8} \div 2\frac{1}{4}\right)^2 + 1\frac{7}{9} = 4\frac{1}{36}$

You must show all your working clearly.

(Total for Question is 5 marks)

Answers & Worked Solutions

I Do

Convert both mixed numbers to improper fractions:
$3\frac{1}{5} = \frac{(3\times5)+1}{5} = \frac{16}{5}$
$2\frac{5}{8} = \frac{(2\times8)+5}{8} = \frac{21}{8}$
Multiply the fractions:
$\frac{16}{5} \times \frac{21}{8}$
Cross-simplify the 16 and the 8 by dividing both by 8:
$\frac{2}{5} \times \frac{21}{1} = \frac{42}{5}$
Convert the improper fraction back to a mixed number:
$42 \div 5 = 8$ remainder 2, which is $\mathbf{8\frac{2}{5}}$.

We Do

Convert to improper fractions:
$2\frac{2}{3} = \frac{8}{3}$
$1\frac{3}{4} = \frac{7}{4}$
Multiply the fractions:
$\frac{8}{3} \times \frac{7}{4} = \frac{56}{12}$
Simplify the fraction by dividing numerator and denominator by 4:
$\frac{56\div4}{12\div4} = \frac{14}{3}$
Convert to a mixed number:
$14 \div 3 = 4$ remainder 2, which is $\mathbf{4\frac{2}{3}}$.

You Do 1

Convert to improper fractions:
$4\frac{1}{2} = \frac{9}{2}$
$1\frac{1}{5} = \frac{6}{5}$
Set up the division and multiply by the reciprocal:
$\frac{9}{2} \div \frac{6}{5} = \frac{9}{2} \times \frac{5}{6}$
Cross-simplify the 9 and the 6 by dividing both by 3:
$\frac{3}{2} \times \frac{5}{2} = \frac{15}{4}$
Convert to a mixed number:
$15 \div 4 = 3$ remainder 3, which is $\mathbf{3\frac{3}{4}}$.

You Do 2

Convert to improper fractions:
$5\frac{1}{4} = \frac{21}{4}$
$2\frac{5}{6} = \frac{17}{6}$
Find a common denominator for 4 and 6, which is 12:
$\frac{21\times3}{4\times3} = \frac{63}{12}$
$\frac{17\times2}{6\times2} = \frac{34}{12}$
Subtract the numerators:
$\frac{63}{12} - \frac{34}{12} = \frac{29}{12}$
Convert to a mixed number:
$29 \div 12 = 2$ remainder 5, which is $\mathbf{2\frac{5}{12}}$.

You Do 3

First, calculate the addition inside the brackets:
$2\frac{1}{2} = \frac{5}{2}$ and $1\frac{1}{4} = \frac{5}{4}$
Common denominator is 4: $\frac{5}{2} = \frac{10}{4}$
$\frac{10}{4} + \frac{5}{4} = \frac{15}{4}$
Now, convert the number outside the bracket:
$1\frac{2}{3} = \frac{5}{3}$
Multiply the results:
$\frac{5}{3} \times \frac{15}{4}$
Cross-simplify the 15 and 3 (divide by 3):
$\frac{5}{1} \times \frac{5}{4} = \frac{25}{4}$
Convert to a mixed number:
$25 \div 4 = 6$ remainder 1, which is $\mathbf{6\frac{1}{4}}$.

Challenge 1

Calculate the subtraction inside the brackets:
$1\frac{1}{8} = \frac{9}{8}$
Common denominator for $\frac{9}{8}$ and $\frac{3}{4}$ is 8:
$\frac{3}{4} = \frac{6}{8}$
$\frac{9}{8} - \frac{6}{8} = \frac{3}{8}$
Now, convert the number outside the bracket:
$2\frac{1}{4} = \frac{9}{4}$
Perform the division by multiplying by the reciprocal:
$\frac{9}{4} \div \frac{3}{8} = \frac{9}{4} \times \frac{8}{3}$
Cross-simplify (9 and 3 divide by 3; 8 and 4 divide by 4):
$\frac{3}{1} \times \frac{2}{1} = \mathbf{6}$.

Challenge 2

The formula for the area of a rectangle is: Area = length × width.
To find the length, we divide the area by the width:
Length $= 12\frac{1}{2} \div 2\frac{1}{7}$
Convert to improper fractions:
$12\frac{1}{2} = \frac{25}{2}$
$2\frac{1}{7} = \frac{15}{7}$
Perform the division:
$\frac{25}{2} \div \frac{15}{7} = \frac{25}{2} \times \frac{7}{15}$
Cross-simplify the 25 and 15 by dividing both by 5:
$\frac{5}{2} \times \frac{7}{3} = \frac{35}{6}$
Convert to a mixed number:
$35 \div 6 = 5$ remainder 5, which is exactly $\mathbf{5\frac{5}{6}}$ **cm**.

Extreme Challenge

First, calculate the division inside the brackets:

$3\frac{3}{8} = \frac{27}{8}$

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

$\frac{27}{8} \div \frac{9}{4} = \frac{27}{8} \times \frac{4}{9}$

Cross-simplify: $\frac{27}{9} = 3$ and $\frac{4}{8} = \frac{1}{2}$, giving $\frac{3}{2} \times \frac{1}{1} = \frac{3}{2}$

Next, square the result from the brackets:

$\left(\frac{3}{2}\right)^2 = \frac{3^2}{2^2} = \frac{9}{4}$

Now, add the final term. Convert $1\frac{7}{9}$ to an improper fraction:

$1\frac{7}{9} = \frac{16}{9}$

Add the fractions: $\frac{9}{4} + \frac{16}{9}$

Find a common denominator, which is 36:

$\frac{9\times9}{4\times9} = \frac{81}{36}$

$\frac{16\times4}{9\times4} = \frac{64}{36}$

$\frac{81}{36} + \frac{64}{36} = \frac{145}{36}$

Convert back to a mixed number:

$36 \times 4 = 144$

$145 \div 36 = 4$ remainder 1, which gives exactly $\mathbf{4\frac{1}{36}}$.