

Fix it 1 Improper fractions

Mixed numbers · ANSWERS

Multiply the whole number by the denominator, then add the numerator. That is the new numerator.
The denominator stays the same.

EXAMPLE

Write $2\frac{3}{7}$ as an improper fraction.

1. Whole number $\times$ denominator:

$$2 \times 7 = 14$$

2. Add the numerator: $14 + 3 = 17$

3. The denominator stays 7, so $\frac{17}{7}$

YOUR TURN

1 Write $3\frac{3}{8}$ as an improper fraction.

$$\frac{27}{8}$$

2 Write $6\frac{5}{9}$ as an improper fraction.

$$\frac{59}{9}$$

3 Write $2\frac{1}{6}$ and $1\frac{11}{12}$ as improper fractions.

$$\frac{13}{6} \text{ and } \frac{23}{12}$$

Check: Divide your numerator by the denominator. The answer and the remainder give the mixed number back.

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Fix it 2 The lowest common denominator

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Find the lowest number both denominators go into: count up in the bigger denominator until the smaller one goes into it.

EXAMPLE

Find the lowest common denominator of $\frac{7}{4}$ and $\frac{13}{6}$.

1. Count up in the bigger denominator:

6, 12

2. 4 goes into 12.

3. Lowest common denominator: 12

4. $4 \times 6 = 24$ works too, but the numbers get bigger.

YOUR TURN

1 Find the lowest common denominator of $\frac{8}{3}$ and $\frac{9}{5}$.

$$15$$

2 Find the lowest common denominator of $\frac{11}{8}$ and $\frac{17}{6}$.

$$24$$

3 Find the lowest common denominator of $\frac{20}{9}$ and $\frac{31}{12}$.

$$36$$

Check: Divide your denominator by each of the two denominators. Both give whole numbers.

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Fix it 3 Equivalent fractions

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Work out what the denominator is multiplied by to make the common denominator. Multiply the numerator by the same number.

EXAMPLE

Write $\frac{7}{4}$ and $\frac{13}{6}$ with denominator 12.

1. $4 \times 3 = 12$, so $7 \times 3 = 21$: $\frac{21}{12}$

2. $6 \times 2 = 12$, so $13 \times 2 = 26$: $\frac{26}{12}$

YOUR TURN

1 Write $\frac{11}{3}$ with denominator 15.

$$\frac{55}{15}$$

2 Write $\frac{9}{4}$ and $\frac{7}{6}$ with denominator 12.

$$\frac{27}{12} \text{ and } \frac{14}{12}$$

3 Write $\frac{17}{6}$ and $\frac{13}{8}$ with denominator 24.

$$\frac{68}{24} \text{ and } \frac{39}{24}$$

Check: Simplify your new fraction. You get the fraction you started with.

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Fix it 4 Add or subtract the numerators

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Once the denominators are the same, add or subtract the numerators. The denominator stays the same.

EXAMPLE

Work out $\frac{21}{12} + \frac{26}{12}$

1. Add the numerators: $21 + 26 = 47$

2. The denominator stays 12: $\frac{47}{12}$

3. Not $\frac{47}{24}$: the parts are still twelfths.

YOUR TURN

1 Work out $\frac{23}{10} + \frac{14}{10}$

$$\frac{37}{10}$$

2 Work out $\frac{47}{15} - \frac{21}{15}$

$$\frac{26}{15}$$

3 Work out $\frac{95}{36} - \frac{58}{36}$

$$\frac{37}{36}$$

Check: Undo it: take away what you added, or add back what you took away. You get the first fraction.

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Fix it 5 Back to a mixed number

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Divide the numerator by the denominator. The answer is the whole number and the remainder is the new numerator. The denominator stays the same.

EXAMPLE

Write $\frac{47}{12}$ as a mixed number.

1. $47 \div 12 = 3$ remainder 11
2. 3 wholes, and 11 twelfths left
3. So $3\frac{11}{12}$

YOUR TURN

- 1 Write $\frac{29}{8}$ as a mixed number.

$$3\frac{5}{8}$$

- 2 Write $\frac{53}{12}$ as a mixed number.

$$4\frac{5}{12}$$

- 3 Write $\frac{71}{9}$ as a mixed number.

$$7\frac{8}{9}$$

Check: Turn it back: whole number $\times$ denominator + numerator gives the numerator you started with.

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Fix it 6 Simplest form

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Divide the numerator and denominator of the fraction by the highest number that goes into both. The whole number stays the same.

EXAMPLE

Write $2\frac{10}{12}$ in its simplest form.

1. 2 goes into 10 and 12.
2. $10 \div 2 = 5$ and $12 \div 2 = 6$
3. The whole number stays 2: $2\frac{5}{6}$

YOUR TURN

- 1 Write $3\frac{4}{10}$ in its simplest form.

$$3\frac{2}{5}$$

- 2 Write $1\frac{9}{15}$ in its simplest form.

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

- 3 Write $4\frac{18}{24}$ in its simplest form.

$$4\frac{3}{4}$$

Check: No number bigger than 1 goes into both the numerator and the denominator now.

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Round each mixed number to the nearest whole number and work it out. Your answer should be close to this estimate.

EXAMPLE

Check $3\frac{1}{8} + 2\frac{5}{6} = 5\frac{23}{24}$

1. $3\frac{1}{8}$ rounds to 3, $2\frac{5}{6}$ rounds to 3

2. $3 + 3 = 6$

3. $5\frac{23}{24}$ is close to 6 ✓

YOUR TURN

1 Estimate $5\frac{7}{8} - 2\frac{1}{6}$ by rounding each to the nearest whole number.

$$6 - 2 = 4$$

2 Estimate $4\frac{2}{9} + 3\frac{3}{4}$ by rounding each to the nearest whole number.

$$4 + 4 = 8$$

3 Ava says $6\frac{1}{5} - 2\frac{3}{4} = 4\frac{11}{20}$. Estimate to check. Is Ava right?

$$\text{No: about } 6 - 3 = 3$$

Check: Each rounding moves a number by a half at most, so your answer is within 1 of the estimate.

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