Adding and Subtracting Fractions **Answers**

1. Find the lowest common multiples for each pair of numbers.

a. 3 and 4

12

b. 5 and 7

35

c. 3 and 6

6

d. 4 and 8

8

e. 5 and 15

15

f. 8 and 10

40

g. 4 and 7

28

h. 2 and 5

10

2. Calculate each of the following questions, making sure all answers are in their simplest form.

a. $\frac{2}{5} + \frac{2}{5}$

$\mathbf{\frac{4}{5}}$

b. $\frac{6}{8} - \frac{1}{8}$

$\mathbf{\frac{5}{8}}$

c. $\frac{1}{9} + \frac{2}{9}$

$\mathbf{\frac{3}{9} = \frac{1}{3}}$

d. $\frac{2}{3} + \frac{1}{3}$

$\mathbf{\frac{3}{3} = 1}$

e. $\frac{13}{18} - \frac{4}{18}$

$\mathbf{\frac{9}{18} = \frac{1}{2}}$

3. Calculate each of the following questions, giving your answers as fractions in their simplest form.

a. $\frac{2}{5} + \frac{3}{10}$

$\mathbf{\frac{4}{10} + \frac{3}{10} = \frac{7}{10}}$

b. $\frac{1}{8} + \frac{1}{2}$

$\mathbf{\frac{1}{8} + \frac{4}{8} = \frac{5}{8}}$

c. $\frac{10}{12} - \frac{1}{6}$

$\mathbf{\frac{10}{12} - \frac{2}{12} = \frac{8}{12} = \frac{2}{3}}$

d. $\frac{3}{5} - \frac{4}{15}$

$\mathbf{\frac{9}{15} - \frac{4}{15} = \frac{5}{15} = \frac{1}{3}}$

e. $\frac{1}{2} + \frac{1}{5}$

$\mathbf{\frac{5}{10} + \frac{2}{10} = \frac{7}{10}}$

f. $\frac{3}{5} - \frac{2}{7}$

$\mathbf{\frac{21}{35} - \frac{10}{35} = \frac{11}{35}}$

g. $\frac{5}{9} - \frac{3}{11}$

$\mathbf{\frac{55}{99} - \frac{27}{99} = \frac{28}{99}}$

h. $\frac{5}{6} + \frac{3}{7}$

$\mathbf{\frac{35}{42} + \frac{18}{42} = \frac{53}{42} = 1\frac{11}{42}}$

4. Calculate each of the following questions, giving your answers as mixed number fractions in their simplest form.

a. $1\frac{1}{4} + 2\frac{1}{5}$

$\mathbf{\frac{5}{4} + \frac{11}{5}}$

$\mathbf{\frac{25}{20} + \frac{44}{20} = \frac{69}{20} = 3\frac{9}{20}}$

b. $2\frac{1}{6} + 3\frac{1}{2}$

$\mathbf{\frac{13}{6} + \frac{7}{2}}$

$\mathbf{\frac{26}{12} + \frac{42}{12} = \frac{68}{12} = 5\frac{2}{3}}$

c. $5\frac{1}{7} - 2\frac{1}{3}$

$\mathbf{\frac{36}{7} - \frac{7}{3}}$

$\mathbf{\frac{108}{21} - \frac{49}{21} = \frac{59}{21} = 2\frac{17}{21}}$

d. $3\frac{5}{8} + 1\frac{1}{12}$

$\mathbf{\frac{29}{8} + \frac{13}{12}}$

$\mathbf{\frac{87}{24} + \frac{26}{24} = \frac{113}{24} = 4\frac{17}{24}}$

e. $6\frac{3}{5} + 4\frac{3}{4}$

$\mathbf{\frac{33}{5} + \frac{19}{4}}$

$\mathbf{\frac{132}{20} + \frac{95}{20} = \frac{227}{20} = 11\frac{7}{20}}$

5. Jameela wins some money. She gives $\frac{1}{2}$ the money to her family and spends $\frac{2}{9}$ on a car. What fraction of the money does she have left?

$\frac{1}{2} + \frac{2}{9} = \frac{13}{18}$

$1 - \frac{13}{18} = \frac{5}{18}$ of the money left.

Challenge

A rectangular mobile phone has a length of $13\frac{1}{2}$cm and a width of $5\frac{3}{4}$cm. Calculate the perimeter of the phone, giving your answer as a mixed number fraction in its simplest form.

$13\frac{1}{2} + 5\frac{3}{4} + 13\frac{1}{2} + 5\frac{3}{4}$

$\frac{27}{2} + \frac{23}{4} + \frac{27}{2} + \frac{23}{4}$

$\frac{54}{4} + \frac{23}{4} + \frac{54}{4} + \frac{23}{4} = \frac{154}{4} = 38\frac{1}{2}$cm

Adding and Subtracting Fractions

Prior Knowledge:

- Equivalent fractions.
- Writing fractions in their simplest form.
- Lowest common multiple.
- How to convert between mixed number and improper fractions.

In a fraction, the denominator (the bottom part) tells you how many equal parts there are in a whole and the numerator (top part) tells you how many parts you have. You are able to add and subtract fractions that have the same denominator.

Fractions with the Same Denominator	
Example 1 Calculate $\frac{2}{10} + \frac{5}{10}$. To add fractions which have the same denominator, you must add only the numerators together. $\frac{2}{10} + \frac{5}{10} = \frac{7}{10}$	**Example 2** Calculate $\frac{3}{8} - \frac{2}{8}$. To subtract fractions which have the same denominator, you must subtract only the numerators. $\frac{3}{8} - \frac{2}{8} = \frac{1}{8}$

You can add or subtract fractions with different denominators by first writing them as equivalent fractions with the same denominator.

Fractions with Different Denominators

Example 3

Calculate $\frac{2}{3} + \frac{1}{4}$.

1. Find the lowest common multiple for 3 and 4.

   12

2. This becomes the denominator for both fractions.

   $\frac{\square}{12} + \frac{\square}{12}$

3. Write the equivalent fraction for $\frac{2}{3}$.

   $\frac{8}{12}$

4. Write the equivalent fraction for $\frac{1}{4}$.

   $\frac{3}{12}$

5. Now that the denominators are the same, perform the addition.

   $\frac{8}{12} + \frac{3}{12} = \frac{11}{12}$

Example 4

Calculate $\frac{5}{10} - \frac{1}{6}$, giving your answer as a fraction in its simplest form.

1. Find the lowest common multiple for 10 and 6.

   30

2. This becomes the denominator for both fractions.

   $\frac{\square}{30} - \frac{\square}{30}$

3. Write the equivalent fraction for $\frac{5}{10}$.

   $\frac{15}{30}$

4. Write the equivalent fraction for $\frac{1}{6}$.

   $\frac{5}{30}$

5. Now that the denominators are the same, perform the subtraction.

   $\frac{15}{30} - \frac{5}{30} = \frac{10}{30}$

6. Finally, write the fraction in its simplest form.

   $\frac{10}{30} = \frac{1}{3}$

Adding and Subtracting Mixed Number Fractions

Example 5

Calculate $1\frac{2}{5} + 3\frac{1}{4}$, giving your answer as a mixed number fraction in its simplest form.

Start by converting each of the mixed number fractions into an improper fraction.

$1\frac{2}{5} = \frac{7}{5}$

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

Re-write as equivalent fractions with the same denominator.

$\frac{7}{5} = \frac{28}{20}$

$\frac{13}{4} = \frac{65}{20}$

Perform the addition.

$\frac{28}{20} + \frac{65}{20} = \frac{93}{20}$

Finally, write the fraction as a mixed number fraction in its simplest form.

$\frac{93}{20} = 4\frac{13}{20}$

Your Turn

1. Find the lowest common multiples for each pair of numbers.

a. 3 and 4

b. 5 and 7

c. 3 and 6

d. 4 and 8

e. 5 and 15

f. 8 and 10

g. 4 and 7

h. 2 and 5

2. Calculate each of the following questions, making sure all answers are in their simplest form.

a. $\frac{2}{5}+\frac{2}{5}$

b. $\frac{6}{8}-\frac{1}{8}$

c. $\frac{1}{9}+\frac{2}{9}$

d. $\frac{2}{3}+\frac{1}{3}$

e. $\frac{13}{18}-\frac{4}{18}$

3. Calculate each of the following questions, giving your answers as fractions in their simplest form.

a. $\frac{2}{5}+\frac{3}{10}$

b. $\frac{1}{8}+\frac{1}{2}$

c. $\frac{10}{12}-\frac{1}{6}$

d. $\frac{3}{5}-\frac{4}{15}$

e. $\frac{1}{2}+\frac{1}{5}$

f. $\frac{3}{5}-\frac{2}{7}$

g. $\frac{5}{9}-\frac{3}{11}$

h. $\frac{5}{6}+\frac{3}{7}$

4. Calculate each of the following questions, giving your answers as mixed number fractions in their simplest form.

a. $1\frac{1}{4} + 2\frac{1}{5}$

b. $2\frac{1}{6} + 3\frac{1}{2}$

c. $5\frac{1}{7} - 2\frac{1}{3}$

d. $3\frac{5}{8} + 1\frac{1}{12}$

e. $6\frac{3}{5} + 4\frac{3}{4}$

5. Jameela wins some money. She gives $\frac{1}{2}$ the money to her family and spends $\frac{2}{9}$ on a car. What fraction of the money does she have left?

Challenge

A rectangular mobile phone has a length of $13\frac{1}{2}$cm and a width of $5\frac{3}{4}$cm. Calculate the perimeter of the phone, giving your answer as a mixed number fraction in its simplest form.

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You can add or subtract fractions with different denominators by first writing them as equivalent fractions with the same denominator.

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5. Now that the denominators are the same, perform the addition.

   $\frac{8}{12} + \frac{3}{12} = \frac{11}{12}$

Example 4

Calculate $\frac{5}{10} - \frac{1}{6}$, giving your answer as a fraction in its simplest form.

1. Find the lowest common multiple for 10 and 6.

   30

2. This becomes the denominator for both fractions.

   $\frac{\square}{30} - \frac{\square}{30}$

3. Write the equivalent fraction for $\frac{5}{10}$.

   $\frac{15}{30}$

4. Write the equivalent fraction for $\frac{1}{6}$.

   $\frac{5}{30}$

5. Now that the denominators are the same, perform the subtraction.

   $\frac{15}{30} - \frac{5}{30} = \frac{10}{30}$

6. Finally, write the fraction in its simplest form.

   $\frac{10}{30} = \frac{1}{3}$

Adding and Subtracting Mixed Number Fractions

Example 5

Calculate $1\frac{2}{5} + 3\frac{1}{4}$, giving your answer as a mixed number fraction in its simplest form.

Start by converting each of the mixed number fractions into an improper fraction.

$1\frac{2}{5} = \frac{7}{5}$

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

Re-write as equivalent fractions with the same denominator.

$\frac{7}{5} = \frac{28}{20}$

$\frac{13}{4} = \frac{65}{20}$

Perform the addition.

$\frac{28}{20} + \frac{65}{20} = \frac{93}{20}$

Finally, write the fraction as a mixed number fraction in its simplest form.

$\frac{93}{20} = 4\frac{13}{20}$

Your Turn

1. Find the lowest common multiples for each pair of numbers.

a. 3 and 4

_____

b. 5 and 7

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c. 3 and 6

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d. 4 and 8

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e. 5 and 15

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f. 8 and 10

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h. 2 and 5

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2. Calculate each of the following questions, making sure all answers are in their simplest form.

a. $\frac{2}{5}+\frac{2}{5}$

b. $\frac{6}{8}-\frac{1}{8}$

c. $\frac{1}{9}+\frac{2}{9}$

d. $\frac{2}{3}+\frac{1}{3}$

e. $\frac{13}{18}-\frac{4}{18}$

3. Calculate each of the following questions, giving your answers as fractions in their simplest form.

a. $\frac{2}{5}+\frac{3}{10}$

b. $\frac{1}{8}+\frac{1}{2}$

c. $\frac{10}{12}-\frac{1}{6}$

d. $\frac{3}{5}-\frac{4}{15}$

e. $\frac{1}{2}+\frac{1}{5}$

f. $\frac{3}{5}-\frac{2}{7}$

g. $\frac{5}{9}-\frac{3}{11}$

h. $\frac{5}{6}+\frac{3}{7}$

4. Calculate each of the following questions, giving your answers as mixed number fractions in their simplest form.

a. $1\frac{1}{4} + 2\frac{1}{5}$

b. $2\frac{1}{6} + 3\frac{1}{2}$

c. $5\frac{1}{7} - 2\frac{1}{3}$

d. $3\frac{5}{8} + 1\frac{1}{12}$

e. $6\frac{3}{5} + 4\frac{3}{4}$

5. Jameela wins some money. She gives $\frac{1}{2}$ the money to her family and spends $\frac{2}{9}$ on a car. What fraction of the money does she have left?

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