Adding and Subtracting Fractions **Answers**

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

   a. 3 and 4

   12

   e. 5 and 15

   15

   b. 5 and 7

   35

   f. 8 and 10

   40

   c. 3 and 6

   6

   g. 4 and 7

   28

   d. 4 and 8

   8

   h. 2 and 5

   10

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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?

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

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

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.

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

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

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

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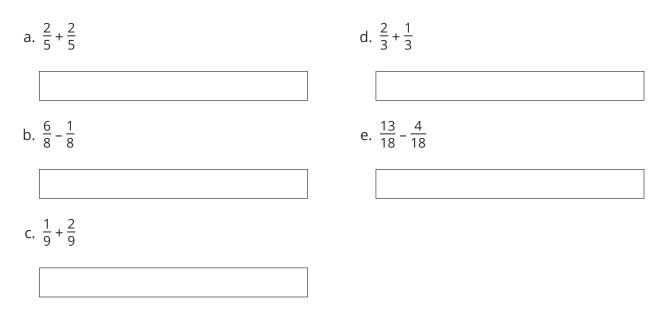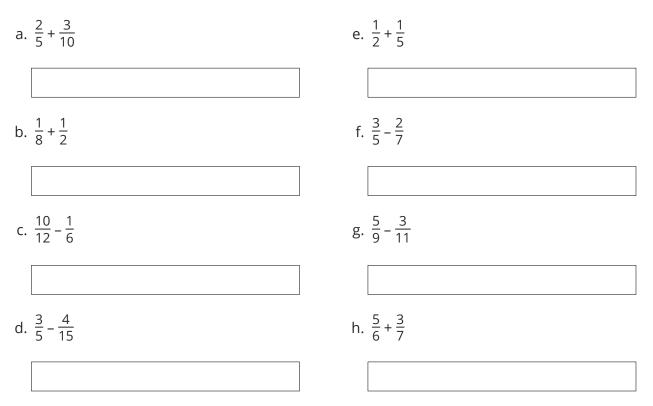
$\frac{93}{20} = 4\frac{13}{20}$

Your Turn

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

   a. 3 and 4

   e. 5 and 15

   b. 5 and 7

   f. 8 and 10
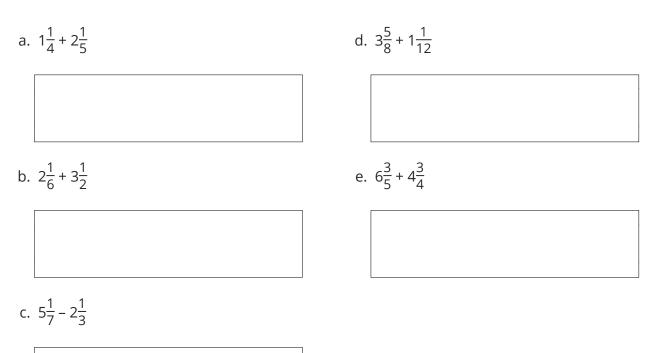
   c. 3 and 6

   g. 4 and 7

   d. 4 and 8

   h. 2 and 5

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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.

Adding and Subtracting 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

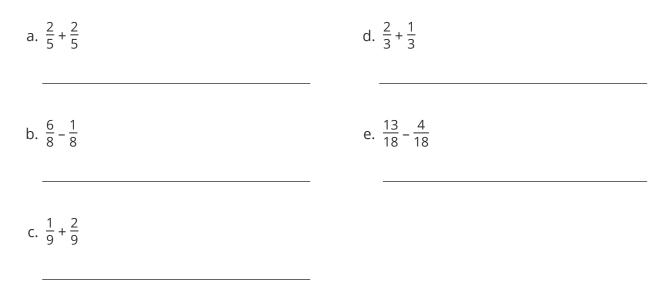1. Find the lowest common multiples for each pair of numbers.

    a. 3 and 4

                                                  e. 5 and 15

    b. 5 and 7

                                                  f. 8 and 10

    c. 3 and 6

                                                  g. 4 and 7

    d. 4 and 8

                                                  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.

   _____

   _____

   _____

In response to the challenges presented by the ongoing Coronavirus situation, the Beyond team have made it their top priority to ensure that you and your children are catered to for your home-based educational needs. As such, we have decided to introduce **Interactive Resources** that can be completed using free-to-download PDF reading software, on a home PC/Laptop or Android/IOS smart device, sparing you the need to print where possible. By following the guidance below, we hope to offer you a smooth, stress-free means of continuing your children's education from the comfort of your home.

Step 1: Download _____ for PC/Mac (or search 'Adobe Acrobat Reader' on Google Play or the App Store).

Follow the link above to open the download page for the PC/Mac version of Adobe Acrobat Reader. Click 'Download Acrobat Reader' at the bottom of the middle column - this will take you to a download page where your download will begin. Open the downloaded file and Acrobat Reader will install automatically (check the 'Launch Adobe Acrobat Reader DC' checkbox before clicking 'Finish' if you would like to open the program straight away).

Step 2: Download one of our interactive resources, and open using Adobe Acrobat Reader DC.

If you are a PC/Mac user and your downloaded PDF resource does not open using Acrobat Reader by default, simply right-click your PDF file, go to 'Open with' and select Adobe Acrobat Reader DC from the drop-down list.

For smart device users, open the Adobe Acrobat Reader app, press 'Files' at the bottom of the homescreen, then press 'On this device' and select the PDF you wish to open.

Step 3: Complete the resource!

For PC/Mac users: To fill in the resource, click the text fields and type your answers as needed. Check boxes and radio buttons can simply be clicked on to make the selection of your choice. When you are finished with the resource, go to File > Save As... and save your file where you like (we recommend you do not save over the original PDF, as you may wish to use it again without first having to remove all the answers!)

For smart device users: To fill in the resource, press the text fields and type your answers as needed. Check boxes and radio buttons can simply be clicked on to make the selection of your choice. When you are finished, simply press the back button in the top left of the appscreen and your PDF will save automatically (this will overwrite the original file, so you may wish to create a copy if you would like to use the resource again in future without first having to remove all the answers!)

Step 4: Rinse and repeat!

We hope you have found this information useful. If you experience any problems in getting the above method to work, please do contact the Beyond team at _____ and we will endeavour to do what we can to assist you.