

# Reasoning and Problem Solving

## Step 7: Add and Subtract Fractions 1

### National Curriculum Objectives:

Mathematics Year 6: (6F2) [Use common factors to simplify fractions; use common multiples to express fractions in the same denomination](#)

Mathematics Year 6: (6F4) [Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions](#)

Mathematics Year 6: (6F11) [Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts](#)

### Differentiation:

Questions 1, 4 and 7 (Reasoning)

**Developing** Read two statements about a calculation and determine which one is correct (where denominators are direct multiples of the same number).

**Expected** Read two statements about a calculation and determine which one is correct (where denominators are not always direct multiples of the same number).

**Greater Depth** Read two statements about a calculation and determine which one is correct (where denominators are not direct multiples of the same number).

Questions 2, 5 and 8 (Problem Solving)

**Developing** Use three out of four fractions to create addition and subtraction calculations. (where denominators are direct multiples of the same number).

**Expected** Use three out of four fractions to create addition and subtraction calculations. (where denominators are not always direct multiples of the same number).

**Greater Depth** Use three out of four fractions to create addition and subtraction calculations. (where denominators are not direct multiples of the same number).

Questions 3, 6 and 9 (Problem Solving)

**Developing** Complete two missing fractions in a part whole model where denominators are direct multiples of the same number.

**Expected** Complete three missing fractions in a part whole model where denominators are not always direct multiples of the same number.

**Greater Depth** Complete four missing fractions in a part whole model where denominators are not direct multiples of the same number.

More [Year 5 and Year 6 Fractions](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

# Add and Subtract Fractions 1

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1a. Look at the subtraction below.

$$\frac{3}{4} - \frac{1}{2}$$



Ollie

The answer will be  $\frac{2}{2}$ .

We need to find the lowest common denominator.



Niamh

Who is correct? Prove it.



6 R

1b. Look at the addition below.

$$\frac{5}{6} + \frac{1}{9}$$



Oceania

We can't calculate this as the denominators are different.

It's the same as...

$$\frac{15}{18} + \frac{2}{18}$$



Reese

Who is correct? Prove it.



6 R

2a. Write two addition or subtraction calculations using three of the following fractions.

$$\frac{3}{5} \quad \frac{3}{10} \quad \frac{6}{15} \quad \frac{9}{10}$$



6 PS

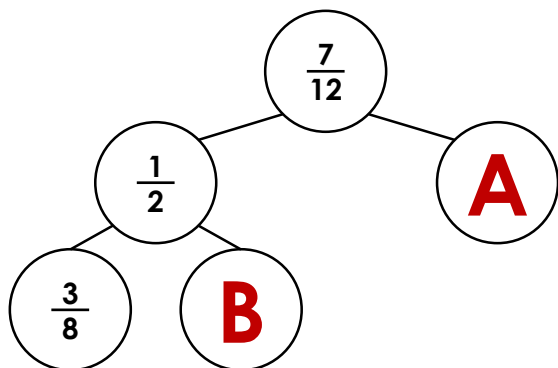
2b. Write two addition or subtraction calculations using three of the following fractions.

$$\frac{5}{8} \quad \frac{3}{16} \quad \frac{3}{4} \quad \frac{13}{16}$$



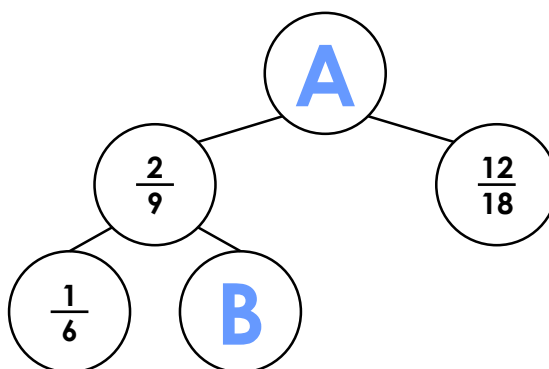
6 PS

3a. Complete the part whole model.



6 PS

3b. Complete the part whole model.



6 PS

# Add and Subtract Fractions 1

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4a. Look at the addition below.

$$\frac{16}{40} + \frac{8}{24} = \frac{8}{16}$$



Leah

The answer can be simplified to  $\frac{1}{2}$ .

The answer is wrong. It should be  $\frac{11}{15}$ .



Elliot

Who is correct? Prove it.



6 R

4b. Look at the subtraction below.

$$\frac{7}{10} - \frac{3}{15}$$



Nuha

It's the same as  $\frac{12}{15} - \frac{3}{15}$

The answer is  $\frac{1}{2}$ .



Eesa

Who is correct? Prove it.



6 R

5a. Write two addition or subtraction calculations using three of the following fractions.

$$\frac{56}{60} \quad \frac{23}{60} \quad \frac{9}{15} \quad \frac{1}{3}$$



6 PS

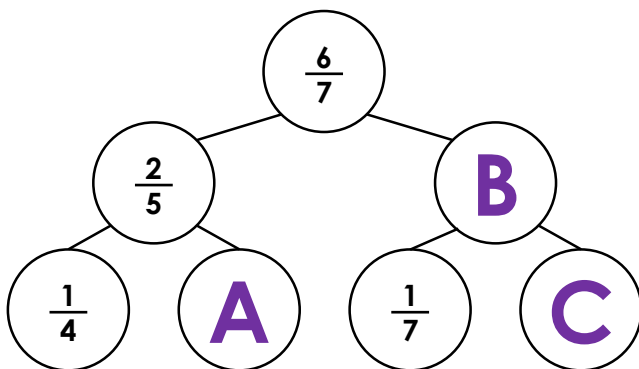
5b. Write two addition or subtraction calculations using three of the following fractions.

$$\frac{6}{13} \quad \frac{22}{39} \quad \frac{10}{13} \quad \frac{4}{39}$$



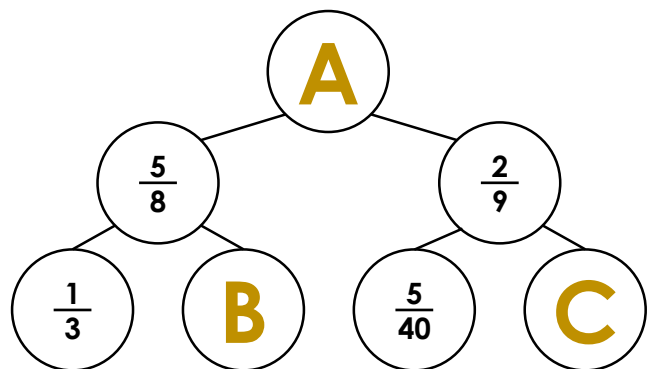
6 PS

6a. Complete the part whole model.



6 PS

6b. Complete the part whole model.



6 PS

# Add and Subtract Fractions 1

# Add and Subtract Fractions 1

7a. Look at the subtraction below.

$$\frac{10}{15} - \frac{9}{45} = \frac{21}{45}$$



Libbie

The answer is  $\frac{7}{15}$ .

The answer is wrong. It should be  $\frac{1}{45}$ .



Will

Who is correct? Prove it.



6 R

7b. Look at the subtraction below.

$$\frac{4}{5} - \frac{7}{9}$$



Serena

The answer will be more than  $\frac{1}{2}$ .

The answer will have a denominator of 45.



Ashton

Who is correct? Prove it.



6 R

8a. Write two addition or subtraction calculations using three of the following fractions.

$$\frac{5}{6} \quad \frac{13}{30} \quad \frac{2}{5} \quad \frac{9}{15}$$

8b. Write two addition or subtraction calculations using three of the following fractions.

$$\frac{1}{2} \quad \frac{2}{18} \quad \frac{4}{9} \quad \frac{2}{36}$$



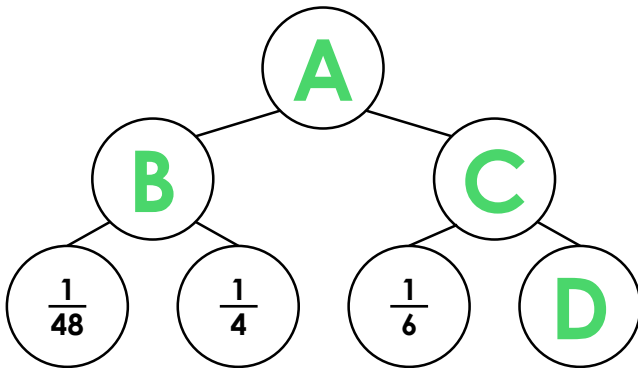
6 PS



6 PS

9a. Complete the part whole model.

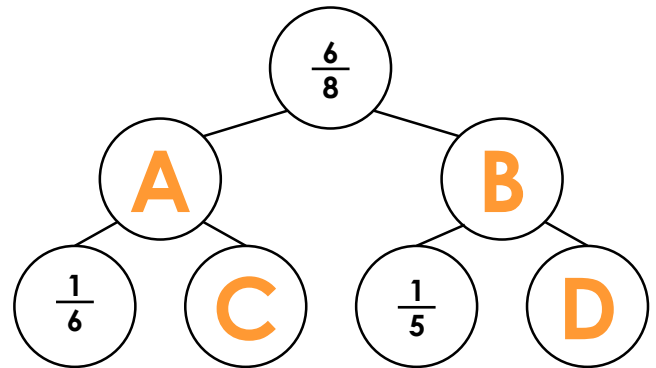
Hint:  $A = 2 \times B$



6 PS

9b. Complete the part whole model.

Hint: B is double A.



6 PS

## Reasoning and Problem Solving Add and Subtract Fractions 1

### Developing

1a. Niamh is correct.  $\frac{3}{4} - \frac{1}{2} = \frac{3}{4} - \frac{2}{4} = \frac{1}{4}$

2a. Various answers, for example:

$$\frac{3}{5} + \frac{3}{10} = \frac{9}{10}, \quad \frac{9}{10} - \frac{3}{10} = \frac{3}{5}, \quad \frac{9}{10} - \frac{3}{5} = \frac{3}{10}$$

3a.  $A = \frac{1}{12}$ ,  $B = \frac{1}{8}$

### Expected

4a. Elliot is correct.  $\frac{16}{40} + \frac{8}{24} = \frac{2}{5} + \frac{1}{3} = \frac{6}{15} + \frac{5}{15} = \frac{11}{15}$

5a. Various answers, for example:

$$\frac{56}{60} - \frac{9}{15} = \frac{1}{3}, \quad \frac{56}{60} - \frac{1}{3} = \frac{9}{15}, \quad \frac{9}{15} + \frac{1}{3} = \frac{56}{60}$$

6a.  $A = \frac{3}{20}$ ,  $B = \frac{16}{35}$ ,  $C = \frac{11}{35}$

### Greater Depth

7a. Libbie is correct, she simplified the answer by dividing numerator and denominator by three,  $\frac{21}{45} = \frac{7}{15}$ .

8a. Various answers, for example:

$$\frac{5}{6} - \frac{2}{5} = \frac{13}{30}, \quad \frac{5}{6} - \frac{13}{30} = \frac{2}{5}, \quad \frac{13}{30} + \frac{2}{5} = \frac{5}{6}$$

9a.  $A = \frac{13}{24}$ ,  $B = \frac{13}{48}$ ,  $C = \frac{13}{48}$ ,  $D = \frac{5}{48}$

Also accept answers which have not been simplified.

## Reasoning and Problem Solving Add and Subtract Fractions 1

### Developing

1b. Reese is correct.  $\frac{5}{6} + \frac{1}{9} = \frac{15}{18} + \frac{2}{18} = \frac{17}{18}$

2b. Various answers, for example:

$$\frac{5}{8} + \frac{3}{16} = \frac{13}{16}, \quad \frac{13}{16} - \frac{5}{8} = \frac{3}{16}, \quad \frac{13}{16} - \frac{3}{16} = \frac{5}{8}$$

3b.  $A = \frac{8}{9}$ ,  $B = \frac{1}{18}$

### Expected

4b. Eesa is correct.  $\frac{7}{10} - \frac{3}{15} = \frac{21}{30} - \frac{6}{30} = \frac{15}{30} = \frac{1}{2}$

5b. Various answers, for example:

$$\frac{6}{13} + \frac{4}{39} = \frac{22}{39}, \quad \frac{22}{39} - \frac{6}{13} = \frac{4}{39}, \quad \frac{22}{39} - \frac{4}{39} = \frac{6}{13}$$

6b.  $A = \frac{61}{72}$ ,  $B = \frac{7}{24}$ ,  $C = \frac{7}{72}$

### Greater Depth

7b. Ashton is correct.  $\frac{4}{5} - \frac{7}{9} = \frac{36}{45} - \frac{35}{45} = \frac{1}{45}$

8b. Various answers, for example:

$$\frac{1}{2} - \frac{4}{9} = \frac{2}{36}, \quad \frac{1}{2} - \frac{2}{36} = \frac{4}{9}, \quad \frac{4}{9} + \frac{2}{36} = \frac{1}{2}$$

9b.  $A = \frac{1}{4}$ ,  $B = \frac{1}{2}$ ,  $C = \frac{1}{12}$ ,  $D = \frac{3}{10}$

Also accept answers which have not been simplified.