

## Adding and Subtracting Algebraic Fractions

### Starter

1. (Review of last lesson)

Simplify: (a)  $\frac{ab^2}{15} \div \frac{a^2}{5b}$  (b)  $\frac{y^2 - 5y + 6}{y^2 + y - 20} \div \frac{y - 2}{3y - 12}$

2. Find the value of: (a)  $\frac{2}{5} + \frac{3}{7}$  (b)  $\frac{5}{9} - \frac{3}{8}$

(c)  $\frac{x}{5} + \frac{x}{4}$  (d)  $\frac{2x - 5}{3} - \frac{x - 2}{4}$

**N.B.** Be careful of signs with (d).

### Notes

Algebraic fractions should be treated in just the same way as numerical fractions. This means that to **add or subtract** them, they need to have a **common denominator**.

**N.B.** Do not expand the common denominator if it is formed by two brackets

### Success Criteria – adding/subtracting when the denominator is a number

1. Find a **common denominator**
2. Put both fractions over the common denominator
3. Combine the fractions into one fraction
4. **Expand** any **brackets** in the **numerator**
5. Collect like terms

**E.g. 1** Express as a single fraction: (a)  $\frac{2x}{5} - \frac{x}{6}$  (b)  $\frac{2d}{7} + \frac{5d}{6}$  (c)  $\frac{5z}{6} - \frac{4z}{9}$

**Working:** (a)  $\frac{2x}{5} - \frac{x}{6} = \frac{12x}{30} - \frac{5x}{30} = \frac{7x}{30}$

**E.g. 2** Express as a single fraction: (a)  $\frac{x - 2}{5} + \frac{x + 1}{3}$  (b)  $\frac{2t + 1}{4} - \frac{t - 1}{3}$

**Working:** (a)  $\frac{x - 2}{5} + \frac{x + 1}{3} = \frac{3(x - 2)}{15} + \frac{5(x + 1)}{15}$  **common denominator**  
 $= \frac{3x - 6}{15} + \frac{5x + 5}{15}$  **expand brackets**  
 $= \frac{8x - 1}{15}$  **add the numerators**

**Video:** [Adding algebraic fractions](#)

[Solutions to Starter and E.g.s](#)

### Exercise

9-1 class textbook:	p520 E16.6 Qu 1-13
A*-G class textbook:	p479 E16.3 Qu 1-13
9-1 homework book:	p176 E16.6 Qu 1-8
A*-G homework book:	p133 E16.3 Qu 1-8

### Summary

Adding/subtracting when the denominator is a number

1. Find a **common denominator**
2. Put both fractions over the common denominator
3. Combine the fractions into one fraction
4. **Expand** any **brackets** in the **numerator**
5. Collect like terms

**Homework book answers (only available during a lockdown)**