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GCSE Mathematics

# Algebraic Fractions

## Questions

Pearson Edexcel GCSE & iGCSE Mathematics

# Section A — Foundation

## Worked Examples

**[Fluency]**

**This topic is assessed at Higher tier only.**

Foundation students should be comfortable with:

- Simplifying numerical fractions  e.g. 12/18 = 2/3
- Adding simple fractions  e.g. 1/3 + 1/4 = 7/12
- Substituting into expressions

**[Reasoning]**

**Review: Simplify 24/36**

$$\frac{24}{36} = \frac{2}{3}$$

**[Problem Solving]**

**Review: Calculate 2/3 + 3/4**

$$\frac{8}{12} + \frac{9}{12} = \frac{17}{12}$$

Foundation students: practise the worked examples above, then attempt Section B.

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# Section B — Higher

## Worked Examples

**[Fluency]**

**Simplify: (x² − 4)/(x + 2)**

$$\frac{(x-2)(x+2)}{x+2} = x - 2$$

**[Reasoning]**

**Add: 2/(x−3) + 3/(x+1)**

$$\frac{2(x+1)+3(x-3)}{(x-3)(x+1)} = \frac{5x-7}{(x-3)(x+1)}$$

**[Problem Solving]**

**Solve: 1/x + 1/(x+2) = 1/3**

$$3(x+2)+3x = x(x+2) \Rightarrow x^2 - 4x - 6 = 0 \Rightarrow x = 2 \pm \sqrt{10}$$

**[Fluency]**

**1.**

Simplify: $\frac{x^2-4}{x+2}$

**(2 marks)**

**[Fluency]**

**2.**

Simplify: $\frac{x^2+5x+6}{x^2+3x+2}$

**(3 marks)**

**[Fluency]**

**3.**

Simplify: $\frac{3x^2-12}{x^2+x-6}$

**(3 marks)**

**[Fluency]**

**4.**

Add: $\frac{2}{x+1} + \frac{3}{x-2}$

**(3 marks)**

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[Fluency]

**5.**

Subtract: $\frac{4}{x-1} - \frac{2}{x+3}$

**(3 marks)**

[Reasoning]

**6.**

Simplify: $\frac{x^2-9}{x+2} \times \frac{x^2+3x+2}{x-3}$

**(4 marks)**

[Reasoning]

**7.**

Solve: $\frac{1}{x} + \frac{1}{x+2} = \frac{1}{3}$

**(5 marks)**

[Reasoning]

**8.**

Solve: $\frac{x+3}{x-1} = \frac{x+1}{x-2}$

**(4 marks)**

[Problem Solving]

**9.**

Simplify fully: $\frac{2x^2+x-6}{x^2-4}$

**(4 marks)**

[Problem Solving]

**10.**

Solve: $\frac{3}{x+2} + \frac{5}{x-1} = 2$

**(6 marks)**

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