
Algebraic Methods: Algebraic Fractions - Edexcel Past Exam Questions

1. The function f is defined by

$$f: x \mapsto \frac{5x+1}{x^2+x-2} - \frac{3}{x+2}, \quad x > 1.$$

Show that $f(x) = \frac{2}{x-1}$, $x > 1$. (4)

June 05 Q3

2. Express

$$\frac{2x^2+3x}{(2x+3)(x-2)} - \frac{6}{x^2-x-2}$$

as a single fraction in its simplest form. (7)

Jan 06 Q2

3. (a) Simplify $\frac{3x^2-x-2}{x^2-1}$. (3)

(b) Hence, or otherwise, express $\frac{3x^2-x-2}{x^2-1} - \frac{1}{x(x+1)}$ as a single fraction in its simplest form. (3)

June 06 Q1

4. $f(x) = 1 - \frac{3}{x+2} + \frac{3}{(x+2)^2}$, $x \neq -2$.

(a) Show that $f(x) = \frac{x^2+x+1}{(x+2)^2}$, $x \neq -2$. (4)

(b) Show that $x^2+x+1 > 0$ for all values of x . (3)

(c) Show that $f(x) > 0$ for all values of x , $x \neq -2$. (1)

Jan 07 Q2

5. $f(x) = \frac{2x+3}{x+2} - \frac{9+2x}{2x^2+3x-2}, \quad x > \frac{1}{2}.$

Show that $f(x) = \frac{4x-6}{2x-1}.$ (7)

June 07 Q2

6. Given that

$$\frac{2x^4 - 3x^2 + x + 1}{(x^2 - 1)} \equiv (ax^2 + bx + c) + \frac{dx + e}{(x^2 - 1)},$$

find the values of the constants a, b, c, d and $e.$ (4)

Jan 08 Q1

7. The function f is defined by

$$f: x \mapsto \frac{2(x-1)}{x^2 - 2x - 3} - \frac{1}{x-3}, \quad x > 3.$$

Show that $f(x) = \frac{1}{x+1}, \quad x > 3.$ (4)

June 08 Q4

8. $f(x) = \frac{2x+2}{x^2-2x-3} - \frac{x+1}{x-3}.$

Express $f(x)$ as a single fraction in its simplest form. (4)

Jan 09 Q2

9. The function f is defined by

$$f(x) = 1 - \frac{2}{(x+4)} + \frac{x-8}{(x-2)(x+4)}, \quad x \in \mathbb{R}, \quad x \neq -4, \quad x \neq 2.$$

Show that $f(x) = \frac{x-3}{x-2}.$ (5)

June 09 Q7

10. Express

$$\frac{x+1}{3x^2-3} - \frac{1}{3x+1}$$

as a single fraction in its simplest form.

(4)

Jan 10 Q1

11. Simplify fully

$$\frac{2x^2+9x-5}{x^2+2x-15}$$

(3)

June 10 Q8

12. (a) Express

$$\frac{4x-1}{2(x-1)} - \frac{3}{2(x-1)(2x-1)}$$

as a single fraction in its simplest form.

(4)

Given that

$$f(x) = \frac{4x-1}{2(x-1)} - \frac{3}{2(x-1)(2x-1)} - 2, \quad x > 1,$$

(b) show that

$$f(x) = \frac{3}{2x-1}$$

(2)

Jan 11 Q2

13. $f(x) = \frac{4x-5}{(2x+1)(x-3)} - \frac{2x}{x^2-9}, \quad x \neq \pm 3, \quad x \neq -\frac{1}{2}$.

Show that

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

(5)

June 11 Q7
