

ALGEBRAIC FRACTIONS

①

Find, in exact surd form, the roots of the equation

$$\frac{x^2+3x}{x^2+5x+6} = \frac{2x^2-x-1}{x^2+8x-9}, x \neq -3, x \neq 1.$$

②

$$\frac{5x}{(x^2+2)(4x^2+3)} \equiv \frac{Ax+B}{x^2+2} + \frac{Cx+D}{4x^2+3},$$

where A, B, C and D are constants.

Determine the value of each of the constants A, B, C and D .

③

Given that

$$\frac{2x^3+x^2-4x+1}{x^2+x-2} \equiv Ax+B+\frac{C}{x+D},$$

use polynomial division, or another appropriate method, to find the value of each of the constants A, B, C and D .

④

Solve the equation

$$\frac{x+11}{2x^2-5x-3} - \frac{x-1}{x-3} + 2 = 0, x \neq -\frac{1}{2}, x \neq 3.$$

⑤

Solve the equation

$$\frac{2}{x-3} + \frac{13}{x^2+4x-21} = 1, x \neq 3, x \neq 7.$$

⑥

Solve the equation

$$\frac{9}{x^2+15x+54} - \frac{2}{x+9} = \frac{1}{x+6}, x \neq -6, x \neq -9.$$

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Given that

$$\frac{4x^4 + 4x^3 - 23x^2 - 4}{x^2 + x - 6} \equiv Ax^2 + Bx + C - \frac{D}{x+E},$$

find the value of each of the constants A, B, C, D and E .

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Show clearly that

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

where a, b and c are integers to be found.

$$\textcircled{8} \quad a=6, b=-5, c=1$$

$$\textcircled{6} \quad x = -4 \quad \textcircled{7} \quad A=4, B=0, C=1, D=1, E=3$$

$$\textcircled{3} \quad A=2, B=-1, C=1, D=2 \quad \textcircled{4} \quad x=1 \quad \textcircled{5} \quad x = -8, 6$$

$$\textcircled{1} \quad x = 2 \pm \sqrt{2} \quad \textcircled{2} \quad A=-1, B=0, C=4, D=0$$