



1. Show that  $\frac{1}{2x^2+x-15} \div \frac{1}{3x^2+9x}$  simplifies to  $\frac{ax}{bx+c}$ , where  $a$ ,  $b$  and  $c$  are integers to be found. (2)

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2. Solve  $\frac{6}{x-1} - \frac{6}{x+1} = 1$  (4)

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3. Simplify fully,  $\frac{5}{2x-6} - \frac{x+2}{x^2-4x+3}$  (4)

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## Solutions

1.

$\frac{1}{2x^2+x-15} \div \frac{1}{3x^2+9x}$ $= \frac{1}{(2x-5)(x+3)} \times \frac{3x(x+3)}{1}$	<b>M1</b>
$= \frac{3x}{2x-5}$	<b>M1</b>

2.

$\frac{6}{x-1} - \frac{6}{x+1} = 1$ $\frac{6(x+1)-6(x-1)}{(x-1)(x+1)} = 1$	<b>M1</b>
$\frac{6x+6-6x+6}{x^2+1} = 1$ $\frac{12}{x^2+1} = 1$	<b>M1</b>
$12 = x^2 + 1$ $x^2 = 11$	<b>M1</b>
$x = \pm \sqrt{11}$	<b>M1</b>

3.

$\frac{5}{2x-6} - \frac{x+2}{x^2-4x+3} = \frac{5}{2(x-3)} - \frac{x+2}{(x-3)(x-1)}$	<b>M1</b>
$= \frac{5(x-1)-2(x+2)}{2(x-3)(x-1)}$ $= \frac{5x-5-2x-4}{2(x-3)(x-1)}$	<b>M1</b>
$= \frac{3x-9}{2(x-3)(x-1)}$	
$= \frac{3(x-3)}{2(x-3)(x-1)}$	<b>M1</b>
$= \frac{3}{2(x-1)}$	<b>M1</b>

