



1. Solve the equation  $x - 6x^{\frac{1}{2}} + 2 = 0$ , giving your answers in the form  $p \pm q\sqrt{r}$ , where  $p$ ,  $q$  and  $r$  are integers. (2)

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2. Solve the equation  $x - 4x^3$  (3)

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3. Solve the equation  $\frac{5}{2-x} + \frac{x-5}{x+2} + \frac{3x+8}{x^2-4} = 0$  (4)

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## Solutions

1.

$x - 6x^{\frac{1}{2}} + 2 = 0$ Square all terms, $x^2 - 36x + 4 = 0$	<b>M1</b>
$x = 16 + 6\sqrt{7}$ $x = 16 - 6\sqrt{7}$	<b>M1</b>

2.

$x - 4x^3 = x(1 - 4x^2) = 0$	<b>M1</b>
$x = 0$	<b>M1</b>
$1 - 4x^2 = 0$ $4x^2 = 1$ $x^2 = \frac{1}{4}$ $x = \pm \sqrt{\frac{1}{2}}$	<b>M1</b>

3.

$\frac{5}{2-x} + \frac{x-5}{x+2} + \frac{3x+8}{x^2-4} = 0$ $\frac{5(x+2)}{(2-x)(x+2)} + \frac{(x-5)(2-x)}{(x+2)(2-x)} + \frac{3x+8}{x^2-4} = 0$	<b>M1</b>
$\frac{3x+8}{x^2-4} = -\frac{3x+8}{4-x^2}$ $\frac{5(x+2)}{(2-x)(x+2)} + \frac{(x-5)(2-x)}{(x+2)(2-x)} - \frac{3x+8}{4-x^2} = 0$	<b>M1</b>
$5x + 10 + 2x - 10 - x^2 + 5x - 3x + 8 = 0$ $5x + 10 + 7x - 10 - x^2 - 3x - 8 = 0$ $x^2 - 9x + 8 = 0$	<b>M1</b>
$(x-1)(x+8) = 0$ $x = 1$ $x = -8$	<b>M1</b>

