Completing The Square Mark Scheme		
1(a)	$(x+2)^2 - 4 + 5$	[1] Factorisation
	$(x+2)^2 + 1$	[1] Final answer
1(b)	$(x-7)^2 - 49 - 1$	[1] Factorisation
	$(x-7)^2 - 50$	[1] Final answer
1(c)	$(x-12)^2 - 144 + 5$	[1] Factorisation
	$(x-12)^2 - 139$	[1] Final answer
2(a)	$(x+5)^2 - 25 + 8$	[1] Factorisation
	$(x+5)^2 - 17$	[1] Final answer
2(b)	$(x-2)^2 - 4 + 16$	[1] Factorisation
	$(x-2)^2 + 12$	[1] Final answer
2(c)	$(x-4)^2 - 16 + 14$	[1] Factorisation
	$(x-4)^2 - 2$	[1] Final answer
3(a)	$(x+3)^2 - 9 + 20$	[1] Factorisation
	$(x+3)^2 + 11$	[1] Final answer
3(b)	$(x+6)^2 - 36 - 8$	[1] Factorisation
	$(x+6)^2 - 44$	[1] Final answer
3(c)	$(x-1)^2 - 1 - 6$	[1] Factorisation
	$(x-1)^2 - 7$	[1] Final answer
4(a)	$x(x-2) = 3$	[1] Mark for $x(x-2) = 3$
	$x^2 - 2x = 3$	
	$x^2 - 2x - 3 = 0$	[1] Mark for rearranging to $x^2 - 2x - 3 = 0$
	$(x-1)^2 - 1 - 3 = 0$	
	$(x-1)^2 - 4 = 0$	[1] Mark for correct completion of the square $(x-1)^2 - 4 = 0$
4(b)	$(x-1)^2 = 4$ $x = 1 \pm \sqrt{4}$	[1] Mark for rearranging for $x = 1 \pm \sqrt{4}$
	$x = 3$	[1] Mark for correctly choosing only $x = 3$ ($x = -1$ must be eliminated because this gives a negative perimeter)
	Perimeter $= 3 + 1 + 3 + 1 = 8$	[1] Mark for perimeter = 8 cm

5	$x + \frac{1}{x} = 4$	[1] Mark for creating the equation $x + \frac{1}{x} = 4$
	$x^2 - 4x + 1 = 0$	[1] 1 Mark for rearranging the equation and multiply all terms by x
	$(x-2)^2 - 3 = 0$ $(x-2)^2 = 3$	[1] 1 Mark for completing the square $(x-2)^2 - 3 = 0$
	$x = 2 \pm \sqrt{3}$	[1] 1 Mark for solving for $x = 2 \pm \sqrt{3}$
	$x = 2 + \sqrt{3}$	[1] Mark for stating that $x = 2 + \sqrt{3}$ is the only valid solution. ($x = 2 - \sqrt{3}$ would be less than 1)
6	$x(x+6) = 36$	[1] 1 mark for $2x(x+6) = 27$
	$x^2 + 6x - 36 = 0$ $[(x+3)^2 - 9] - 36 = 0$ $(x+3)^2 - 45 = 0$ $(x+3)^2 = 45$	[1] Correct rearrangement and factorisation to $(x-3)^2 = 45$
	$x + 3 = \pm\sqrt{45}$	[1] 1 mark for completing the square
	$x = -3 \pm \sqrt{45} = -3 + 3\sqrt{5}$	[1] 1 mark for eliminating $x = 3 - 3\sqrt{5}$ as not a real solution
	Perimeter = $x + x + x + 6 + x + 6 = 4x + 12$	[1] 1 mark for finding an expression for the perimeter of the rectangle.
	$4x + 12 = 4 \times (-3 + 3\sqrt{5}) + 12 = 12\sqrt{5}$	[1] 1 mark for the final answer

END