

Question		Answer	Mks	AO	Guidance	
1	(i)	$2(x^2 - 6x + 11.5)$ $2((x - 3)^2 + 11.5 - 9)$ $2(x - 3)^2 + 5$	B1 B1 M1 A1 [4]	1.1a 1.1 1.1 1.1	or $a = 2$ or $b = -3$ $23 - 2(\text{their } b)^2$ or $c = 5$	
1	(ii)	$2(x + 3)^2 + 5$ is always +ve or $2(x + 3)^2 + 5 > 0$ or $2(x + 3)^2 + 5 \geq 5$ Hence no real roots	B1f [1]	1.1	or $2(x + 3)^2 = -5$, which is impossible or "+ve quadratic" and min on $y = 5$ or "+ve" quadratic; TP at (3, 5). Both Hence no real roots Must use (i), not use D	$2(x + 3)^2 + 5 = 0$ $\Rightarrow x = \sqrt{\text{neg}}$ or $x + 3 = \sqrt{\text{neg}}$ ft their (i) ($a \ \& \ c > 0$)
1	(iii)	$2(x - 3)^2 = 2(x^2 - 6x + 9)$ $k = 18$	M1 A1 [2]	1.1a 2.2a	or $12^2 - 8k = 0$	