Answers and mark guide

Q	Answer	Working	Marks
1	**$x^2 - 10x + 25$**	Multiply out (x + p)(x + p).	2
2	**$x^2 + 2x + 1$**	Multiply out (x + p)(x + p).	2
3	**$x^2 + 6x + 9$**	Multiply out (x + p)(x + p).	2
4	**$x^2 - 12x + 36$**	Multiply out (x + p)(x + p).	2
5	**$x^2 - 2x + 1$**	Multiply out (x + p)(x + p).	2
6	**$(x - 1)^2 + 9$**	Halve the coefficient of x: p = −1; q = 10 − 1	3
7	**$(x - 1)^2 - 8$**	Halve the coefficient of x: p = −1; q = -7 − 1	3
8	**$(x - 1)^2 - 1$**	Halve the coefficient of x: p = −1; q = 0 − 1	3
9	**$(x - 2)^2 + 7$**	Halve the coefficient of x: p = −2; q = 11 − 4	3
10	**$(x + 7)^2 + 2$**	Halve the coefficient of x: p = 7; q = 51 − 49	3
11	**$(x - 4)^2 + 6$; minimum value 6**	The minimum occurs when the bracket is 0, at x = 4.	4
12	**$(x - 3)^2 + 7$; minimum value 7**	The minimum occurs when the bracket is 0, at x = 3.	4
13	**$(x - 5)^2 - 4$; minimum value −4**	The minimum occurs when the bracket is 0, at x = 5.	4
14	**(7, −7)**	Complete the square: $(x - 7)^2 - 7$	4
15	**(5, 0)**	Complete the square: $(x - 5)^2$	4
16	**$2(x + 2)^2 - 6$**	Factor out 2: $2(x^2 + 4x) + 2$; $= 2(x + 2)^2 - 8 + 2$	5
17	**$x = -3 \pm 2\sqrt{2}$**	$(x + 3)^2 = 8$; $x = -3 \pm \sqrt{8}$	5
18	**$13 - (x - 2)^2$**	$-(x^2 - 4x) + 9 = -[(x - 2)^2 - 4] + 9$	5
19	**Minimum 1 at x = 3**	$2(x - 3)^2 + 1$	5
20	**$(x + 2)^2 + 6 \geq 6 > 0$**	A square is never negative, so the minimum value is 6.	4

My score: _____ / 69 Questions 1–15 = 45 marks (Foundation focus)