Question	Answer	Marks	Partial Marks
1(b)	$4x - 6 = 2x$ and $4x - 6 = -2x$ oe	**M1**	
	$x = 3$ $x = 1$	**A2**	**A1** for either correct
	Alternative method		
	$12x^2 - 48x + 36 = 0$ oe	**(B1)**	
	Factorises or solves	**(M1)**	
	$x = 1$, $x = 3$	**(A1)**	
2(a)	$5 - 2(x - 1)^2$	**B3**	Mark final expression **B2** for $-2(x - 1)^2$ or **B1** for $(x - 1)^2$ or $b = -2$, $c = -1$ and **B1** for $5 + b(x + c)^2$ oe with numerical values of b and c or $a = 5$
2(b)	f ≤ *their* 5	**B1**	**STRICT FT** of *their* 5 from **(a)**
3	$5x^2 - 20x + 26$ [= 0]	**M1**	Condone one slip in expansion of brackets or collection of terms
	Correctly finds $b^2 - 4ac$ for *their* $5x^2 - 20x + 26$ [= 0] e.g. $(-20)^2 - 4(5)(26)$	**M1**	**FT** *their* $5x^2 - 20x + 26 = 0$ providing the discriminant is negative for *their* equation
	$400 - 520 < 0$ or -120	**A1**	
	Alternative method		
	$5x^2 - 20x + 26$ [= 0]	**(M1)**	Condone one slip in expansion of brackets or collection of terms
	Completes the square $5(x - 2)^2 + 6$ and states the correct minimum point (2, 6)	**(M1)**	**FT** *their* $5x^2 - 20x + 26 = 0$ providing the minimum point has positive y-coordinate
	Correct conclusion e.g. Minimum point at $y = 6$ therefore does not intersect x-axis oe	**(A1)**	

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Question	Answer	Marks	Partial Marks
4(a)	$4(y-3)^2 = 36-9$ or $4y^2-24y+9\,[=0]$	**M1**	
	$y = 3 \pm \sqrt{\frac{27}{4}}$ or exact equivalent, soi	**A1**	
	$3+\sqrt{\frac{27}{4}}-\left(3-\sqrt{\frac{27}{4}}\right)$ oe	**M1**	**FT** *their* $a \pm \sqrt{b}$ providing b is not a square number
	$\sqrt{27}$ or $3\sqrt{3}$ or exact equivalent, nfww	**A1**	
4(b)	Eliminates one unknown and simplifies terms: $2x^2+83 = x^2-20x$ oe, soi	**M1**	
	$x^2+20x+83=0$	**A1**	
	Applies quadratic formula or completes the square: $x = \frac{-20 \pm \sqrt{20^2-4[1](83)}}{2}$	**M1**	**FT** *their* 3-term quadratic
	$x = -10 \pm \sqrt{17}$	**A1**	
	$y = \frac{1}{-10 \pm \sqrt{17}} \times \frac{-10 \mp \sqrt{17}}{-10 \mp \sqrt{17}}$	**M1**	**FT** *their* $x = a \pm \sqrt{b}$ providing previous **M1** awarded
	$x = -10 \pm \sqrt{17}$, $y = -\frac{10}{83} \mp \frac{\sqrt{17}}{83}$	**A1**	**dep** on all marks previously awarded
5(a)(i)	30 240	**2**	**M1**for $3 \times 7! \times 2$ or ${}^3P_1 \times {}^7P_7 \times {}^2P_1$ oe
5(a)(ii)	17 280	**2**	**M1**for $4! \times 6!$ oe or ${}^4P_4 \times {}^6P_5$ oe
5(b)(i)	35	**2**	**M1** for ${}^7C_4$ or 1 + 4 + 18 + 12
5(b)(ii)	51	**2**	**M1** for ${}^3C_2 \times {}^6C_2 + {}^3C_3 \times {}^6C_1$ oe or 18 + 4 + 3 + 2 + 24

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