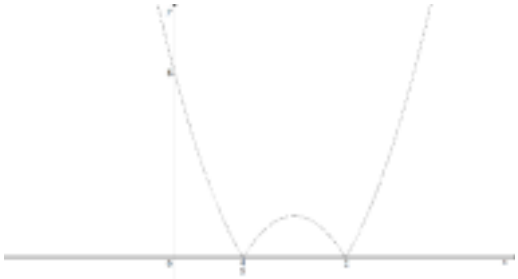
Question	Answer	Marks	Guidance
1(a)	$5\left(x-\frac{7}{5}\right)^2-\frac{9}{5}$	**3**	**B1** for $5(x\pm b)^2$ **B1** for $\left(x-\frac{7}{5}\right)^2$ **B1** for $-\frac{9}{5}$
	Alternative By comparing coefficients: $a(x^2+2bx+b^2)+c=5x^2-14x+8$. $2abx=-14x$ $ab^2+c=8$	**(3)**	**B1** for $a=5$ **B1** for $b=\frac{-14}{10}$ oe **B1** for $c=\frac{-18}{10}$ oe
1(b)	$\left(\frac{7}{5},\ -\frac{9}{5}\right)$	**2**	**FTB1** for each, follow through on *their* a and b from **(a)** **or** **SC1** if differentiation is used in *their* **(a)** or restarted in **(b)** $\frac{dy}{dx}=10x-14=0$ then $\left(\frac{7}{5},\ -\frac{9}{5}\right)$
1(c)		**3**	**B1** for the correct shape. Must have the parabola part of the curve with maximum in the first quadrant and cusps on the x-axis. Ignore labelling of their maximum point if incorrect coordinates **B1** for $\left(\frac{4}{5},\ 0\right)$ and (2, 0), must have a correct shape in the first quadrant. **B1** for (0, 8) must have a correct shape.
1(d)	$0<k<\frac{9}{5}$	**2**	**B1FT** follow through from 0 and *their* $-b$ in part **(a)**
2(a)	$p'(x)=3ax^2+14x+b$ $p''(x)=6ax+14$ leading to $3a+14=32$ $a=6$	**2**	**M1** for attempt to differentiate twice and substitute $x=\frac{1}{2}$

Question	Answer	Marks	Guidance
2(b)	p$\left(\frac{4}{3}\right)$: $80 + 4b + 3c = 0$ oe	**M1**	Must have 3 terms. For use of $x = \frac{4}{3}$, at least once **and** equating to 0 with an attempt at simplification leading to an equation in b and c only Allow one sign error.
	p(–1): $-b + c = 6$ oe	**M1**	Must have 3 terms. For use of $x = -1$ **and** equating to 7 with an attempt at simplification leading to an equation in b and c only
	$b = -14,\ \ c = -8$	**2**	**M1 dep** on both previous **M** marks and attempt to solve simultaneously to obtain both b and c **A1** for both
2(c)	$(3x – 4)(2x^2 + 5x + 2)$	**2**	**B1** for two terms correct in the quadratic factor. Allow if seen as a quotient in long division. For both marks, need to see both factors together. $\left(x - \frac{4}{3}\right)(6x^2 - 15x + 6)$ from synthetic method gets 0 marks unless recovered.
2(d)	$(3x – 4)(2x + 1)(x + 2)$	**B1**	Must be all integers
3(a)	Mid-point (6, –5)	**B1**	
	Gradient of $AB = -\frac{5}{2}$	**B1**	
	Perpendicular gradient $\frac{2}{5}$	**M1**	For *their* perp gradient
	$–9 + 5 = \frac{2}{5}(x – 6)$ oe $x = –4$	**2**	**Dep M1** for attempt at the equation of the perpendicular bisector with *their* mid-point and *their* perpendicular gradient and use of $y = –9$
3(b)	(16, –1)	**2**	**B1** for each, **FT** on 12 – *their a* for the x-coordinate.
4(a)	Area under graph = 800 $\frac{1}{2}(10 \times 10) + (10 \times 10) + \frac{1}{2}(10(10 + V)) +$ $\frac{15V}{2} = 800$	**M1**	For attempt to find the area, allow one error and one omission.
	$V = 48$	**A1**	