Question	Scheme	Marks
4	$y = 3x + 4 \Rightarrow x^2 + (3x+4)^2 + 6x - 4(3x+4) = 4$ **or** $x = \frac{y-4}{3} \Rightarrow \left(\frac{y-4}{3}\right)^2 + y^2 + 6\left(\frac{y-4}{3}\right) - 4y = 4$	M1
	$5x^2 + 9x - 2\ (=0)$ or $5y^2 - 13y - 46\ (=0)$	M1A1
	$(5x-1)(x+2) = 0 \Rightarrow x = \ldots$ or $(5y-23)(y+2) = 0 \Rightarrow y = \ldots$	dM1
	$x = 0.2,\ x = -2$ or $y = 4.6,\ y = -2$	B1
	Substitutes their x into their $y = 3x + 4$ / Substitutes their y into their $x = \frac{y-4}{3}$	M1
	$x = 0.2\left(\text{or}\frac{1}{5}\right),\ y = 4.6\left(\text{or}\,4\frac{3}{5}\,\text{or}\frac{23}{5}\right)$ **and** $x = -2,\ y = -2$	A1
		(7 marks)

Notes

M1 rearrange the linear equation to $y =\ldots$ or $x =\ldots$ and attempts to fully substitute into the second equation.

M1 Collect terms together to produce a 2 or 3 term quadratic expression = 0. The '= 0' may be implied by later work. Condone slips in their rearrangement of the equation.

A1 Correct quadratic equation in x or y. Condone the absence of "$= 0$"
They may be multiples of the main scheme. Eg $10x^2 + 18x - 4 = 0$ or $10y^2 - 26y - 92 = 0$

dM1 Attempt to factorise and solve or complete the square and solve or uses a correct quadratic formula for a 3 term quadratic and obtains at least one value of x or y. (see general guidance for solving a quadratic). If factorising then their **seen** factorised expression must equal their **seen** 3TQ quadratic expression. If they use the quadratic formula, we must see the values embedded in a correct formula.
Dependent on both previous method marks.
They cannot just write down their calculator values for this mark
Guidance on use of calculators for factorising quadratics and how to score:

$\ldots\ldots \Rightarrow 10x^2 + 18x - 4 = 0 \Rightarrow (5x-1)(x+2) = 0 \Rightarrow x = \frac{1}{5}, -2 \Rightarrow \ldots$ max score M1M1A1 dM0 B1M1 A0

$\ldots\ldots \Rightarrow 10x^2 + 18x - 4 = 0 \Rightarrow (x-\frac{1}{5})(x+2) = 0 \Rightarrow x = \frac{1}{5}, -2 \Rightarrow \ldots$ max score M1M1A1 dM0 B1M1 A0

$\ldots \Rightarrow 10x^2 + 18x - 4 = 0 \Rightarrow x = \frac{1}{5}, -2 \Rightarrow \ldots$ max score M1M1A1 dM0 B1M1 A0

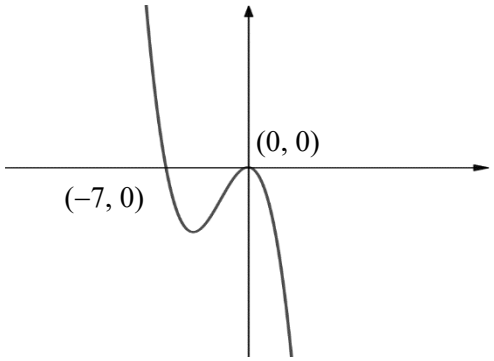
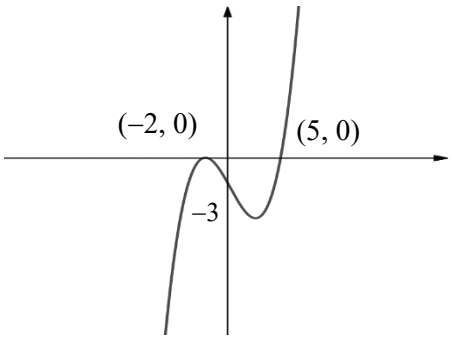
B1 Correct answers for either both values of x or both values of y (possibly unsimplified) which can only be scored if they have achieved a correct 3TQ.

M1 Substitute at least one value of x to find y or vice versa. This may be implied by their final answers.

A1 Fully correct solution **with all previous marks awarded** such that

- working is shown to produce a correct quadratic equation
- working is shown to solve the quadratic equation
- both pairs of coordinates found and simplified. Only withhold if the wrong x coordinate is clearly paired with the other y coordinate.

Condone recovery of invisible brackets.

Question	Scheme		Marks
5(i)(a)		B1 Horizontal translation ← B1 Maximum at origin B1 $(-7,0)$	B1B1B1
			(3)
(b)		B1 Reflection in y-axis B1 Touches at $(-2,0)$ and passes through $(5,0)$ B1 Passes through $(0,-3)$	B1B1B1
			(3)
(ii)a	$x=0 \Rightarrow y=k\cos\left(\frac{\pi}{6}\right)=\sqrt{3}$ $k\frac{\sqrt{3}}{2}=\sqrt{3} \Rightarrow k=2$		B1
(b)	$\left(p=\right)\frac{\pi}{3}$ **or** $\left(q=\right)\frac{4\pi}{3}$ $\left(p=\right)\frac{\pi}{3}$ **and** $\left(q=\right)\frac{4\pi}{3}$		B1 B1
			(3)
			(9 marks)

Notes

(i)(a)

B1 Horizontal translation ←
The negative cubic should appear in quadrants 2, 3 and 4 only and the local maximum should be on the x axis where $x \leq 0$. The local minimum must be in the third quadrant. Condone any part of the graph which may look linear but withhold this mark if the graph curves back on itself.

B1 Local maximum at the origin (does not need to be labelled)