Question Number	Scheme	Marks
7. (a)(i)	$P=(90°,3)$	M1, A1
(ii)	$Q=(540°,0)$	B1 **(3)**
(b)	$(270°,4)$	M1, A1 **(2)** **(5 marks)**

Note we condone the absence of the degree symbol in this question.

(a)(i)

M1 For one value in the coordinate pair of $(90°,3)$. Condone lack of brackets and do not be concerned with *x* or *y* correctly paired for this mark eg condone (…,90˚) or (3,…) Allow in radians.

A1 For both of $(90°,3)$. Allow $x=90,\ y=3$

(a)(ii)

B1 $Q=(540°,0)$ Allow $x=540,\ y=0$

(b)

M1 For one value in the coordinate pair of $(270°,4)$. Condone lack of brackets and do not be concerned with *x* or *y* correctly paired for this mark eg condone (…,270˚) or (4,…). Allow in radians.

A1 For both of $(270°,4)$. Allow $x=270,\ y=4$

For answers missing the brackets or radians(or both) in all parts then penalise the first time the A or B mark is due

FYI (a)(i) $\left(\frac{\pi}{2},3\right)$ (a)(ii) $Q=(3\pi,0)$, (b) $\left(\frac{3\pi}{2},4\right)$ would score M1 A0(first error) B1 M1 A1

For all correct values the wrong way round $(3,90°),(0,540°)(4,270°)$ **SC M1A0B0M1A1**

Question Number	Scheme	Marks
8.	Equates $y=k(2x-1)$ and $y=x^2+2x+11 \Rightarrow k(2x-1)=x^2+2x+11$ $\Rightarrow x^2+(2-2k)x+11+k \quad (=0)$	M1 A1
	Attempts "b^2-4ac"$...0 \Rightarrow (2-2k)^2-4(11+k)...0$ and proceeds to critical values	M1
	Critical values of $(k=)\ 5,-2$	A1
	No roots so $b^2-4ac<0$ so choose inside region $-2<k<5$	M1 A1 **(6)** **(6 marks)**

M1 Attempts to equate $y=k(2x-1)$ and $y=x^2+2x+11 \Rightarrow k(2x-1)=x^2+2x+11$

A1 $x^2+(2-2k)x+11+k \quad (=0)$ oe

Correct quadratic or correct values of *a*, *b* and *c*. The terms should be collected on one side of the equation and the *x* terms must have been collected together in a bracket. Condone a missing "=0". This mark may be implied by values of *a*, *b* and *c* used in later work.

M1 Attempts "b^2-4ac" where $a=\pm 1,\ b=\pm 2\pm 2k,\ c=\pm 11\pm k$ to achieve a 3TQ and proceeds to find critical values. Condone arithmetical slips in the rearrangement to a 3TQ. Usual rules for solving a quadratic apply. You may see "$b^2...4ac$".
FYI "b^2-4ac"$=4k^2-12k-40$ (Be careful that this may result from incorrect working which loses the A marks that follow)

A1 Correct critical values $(k=)\ 5,-2$ **MUST HAVE COME FROM CORRECT WORKING**

M1 Finds inside region for their critical values. May be awarded for eg $-2\leqslant k\leqslant 5$ or $-2\leqslant k<5$. Allow this mark if another variable is used.

A1 $-2<k<5$ oe such as $k\in(-2,5)$ cso

Note that $-2<x<5$ is A0