Question Number	Scheme	Marks
1	$r = 2$	B1
	At least one of $\theta = 0, \frac{2\pi}{5}, \frac{4\pi}{5}, \frac{6\pi}{5}, \frac{8\pi}{5}$ oe	B1
	At least 3 of $\theta = 0, \frac{2\pi}{5}, \frac{4\pi}{5}, \frac{6\pi}{5}, \frac{8\pi}{5}$ oe	M1
	$r = 2$, and at least 3 of: $\theta = 0, \frac{2\pi}{5}, \frac{4\pi}{5}, \frac{6\pi}{5}, \frac{8\pi}{5}$	A1
	All correct: $r = 2$, $\theta = 0, \frac{2\pi}{5}, \frac{4\pi}{5}, \frac{6\pi}{5}, \frac{8\pi}{5}$	A1
		(5)

Notes

B1: $r = 2$ which may be implied by their answers.

B1: For at least **one** correct argument e.g. one of $\theta = 0, \frac{2\pi}{5}, \frac{4\pi}{5}, \frac{6\pi}{5}, \frac{8\pi}{5}$ but allow a correct value out of range e.g. at least one of $-\frac{2\pi}{5}, -\frac{4\pi}{5}, -\frac{6\pi}{5}, -\frac{8\pi}{5}$ which may be implied by their answers.
Note that $z = 2$ implies both B marks.

M1: For at least 3 correct and **distinct arguments** which may be out of range as above.
May be implied by their answers. Allow r to be incorrect for this mark.

A1: For the correct value of r and at least 3 correct and distinct arguments **in range**.
e.g. $r = 2$ with any 3 of $\theta = 0, \frac{2\pi}{5}, \frac{4\pi}{5}, \frac{6\pi}{5}, \frac{8\pi}{5}$ which may be implied by their answers.

A1: For the correct value of r and all correct arguments **in range**.

e.g. $r = 2$ with $\theta = 0, \frac{2\pi}{5}, \frac{4\pi}{5}, \frac{6\pi}{5}, \frac{8\pi}{5}$ which may be implied by their answers.
Ignore extra answers outside the range.
For a fully correct solution that has extra solutions in range, deduct the final A mark.
Answers in **degrees**: Penalise once the first time it occurs but do not penalise 0°
For reference: Angles in degrees are: 0, 72, 144, 216, 288
If they subsequently convert the angles to radians then allow recovery.

Note that answers in a general form can score full marks if correct.
e.g. these score full marks:

$$z = 2\left(\cos\frac{2k\pi}{5} + i\sin\frac{2k\pi}{5}\right), (k = 0, 1, 2, 3, 4): \quad r = 2, \ \theta = 0, \frac{2\pi}{5}, \frac{4\pi}{5}, \frac{6\pi}{5}, \frac{8\pi}{5}$$

$$(z =) 2e^{\frac{2k\pi}{5}i}, (k = 0, 1, 2, 3, 4)$$

But

$$z = 2\left(\cos\frac{2k\pi}{5} + i\sin\frac{2k\pi}{5}\right) \text{ scores B1 only.}$$

Note that if $r = 2$ with $\theta = 0, \frac{2\pi}{5}, \frac{4\pi}{5}, \frac{6\pi}{5}, \frac{8\pi}{5}$ is found and the solutions are then formed incorrectly e.g. $z = 2\left(\cos\frac{2\pi}{5} + \sin\frac{2\pi}{5}\right)$ or e.g. $2e^{\frac{2k\pi}{5}}$ then isw can be applied.

2. **In this question you must show all stages of your working.**
Solutions relying entirely on calculator technology are not acceptable.

Use algebra to find the set of values of x for which

$$|x^2 - 9| < |1 - 2x|$$

(6)

(Total for Question 2 is 6 marks)