Question			Answer	Marks	Guidance	Question
1	(i)		the diagonals of a rhombus also intersect at 90°	B1	oe for kite or other valid statement/sketch **B0** if eg rectangle or parallelogram etc also included as having diagonals intersecting at 90°	accept 'diamond' etc reference merely to 'other shapes' having diagonals intersecting at 90° is not sufficient; sketches must have diagonals drawn, intersecting approx. at right angles but need not be ruled
			ABCD is a square ⇒ the diagonals of quadrilateral ABCD intersect at 90°	B1 **[2]**	oe; **B0** if no attempt at explanation (explanation does not need to gain a mark)	Do not accept → oe

1	(ii)		eg 8 is an integer but $\sqrt{8}$ is not an integer			0 for 'the square root of some integers is a fraction'
			x^2 is an integer ⇐ x is an integer	B1 **[2]**		Do not accept ← oe

Question			Answer	Marks	Guidance	
2	(i)		'if n even then n^3 even, so $n^3 + 1$ odd' oe	B1	must mention n^3 is even or even^3 is even or even × even = even	0 for just 'if n is even, $n^3 + 1$ is odd' 0 if just examples of numbers used
			$\Leftarrow$ with if $n^3 + 1$ odd then n^3 even but if n^3 is even, n is not necessarily an integer or $\Leftrightarrow$ with '$n^3 + 1$ odd then n^3 even so n even', [assuming n is an integer]	B1	or '$\Leftrightarrow$ with if n is odd, n^3 is odd, so $n^3 + 1$ is even' if 0 in question, allow SC1 for $\Leftrightarrow$ or $\Leftarrow$ and attempt at using general odd/even in explanation	condone $\leftrightarrow$ instead of $\Leftrightarrow$ etc in both parts must go further than restating the info in the qn; please annotate as SC
				[2]		
2	(ii)		showing $\Leftarrow$ is true	B1	eg when $x > 3$, +ve × +ve > 0	0 for just example(s) or for simply stating it is true
			$\Leftarrow$ chosen and showing that $\Rightarrow$ [and therefore $\Leftrightarrow$] is/ are not true	B1	stating that true when $x < 2$ or giving a counterexample such as 1, 0 or a negative number [to show quadratic inequality also true for this number] allow B2 for $\Leftarrow$ and $x > 3$ and $x < 2$ shown/stated as soln or sketch showing two solns of $x^2 - 5x + 6 > 0$	0 for saying another solution $x > 2$ or B1 for this argument with another symbol
				[2]		

3	(i) $\Leftarrow$ Q (ii) none [of the ab (iii) $\Rightarrow$ Q	**1** **1** **1**	or $\Leftarrow$ or 'Q $\Rightarrow$ P' or $\Rightarrow$	Condone single arrows

4	mention of –5 as a square root of 25 or $(-5)^2 = 25$ $-5 - 5 \neq 0$ o.e. or $x + 5 = 0$	**M1** **M1**	condone $-5^2 = 25$ or, dep on first M1 being obtained, allow **M1** for showing that 5 is the only soln of $x - 5 = 0$ allow M2 for $x^2 - 25 = 0$ $(x + 5)(x - 5)$ [= 0] so $x - 5 = 0$ or $x + 5 = 0$

5	(i) T (ii) (iii) (iv) F	3	3 for all correct, 2 for 3 correct. 1 for 2 correct	3

6	'If $2n$ is an even integer, then n is an odd integer' showing wrong eg 'if n is an even integer, $2n$ is an even integer'	1 1	or: $2n$ an even integer $\Rightarrow$ n an odd integer or counterexample eg $n = 2$ and $2n = 4$ seen [in either order]	2

7	(i) $\Leftarrow$ Q (ii) $\Leftrightarrow$ Q	1 1	condone omission of P and Q	2