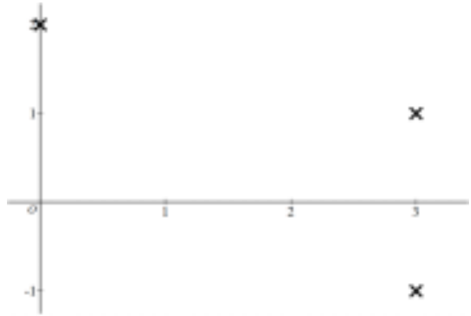
Question	Answer	Marks	Guidance
5(a)	Show u and u^* in relatively correct positions. Must have sense of scale on axes	**B1**	$u = 3 - \mathrm{i}$, $u^* = 3 + \mathrm{i}$ Ignore labels.
	Show $u^* - u$ in a relatively correct position. Must have sense of scale on axes	**B1**	2i. Scale only on Imaginary axis is sufficient for this mark.
	State that *OABC* is a parallelogram [independent of previous marks]	**B1**	Ignore 'quadrilateral'. Allow 'trapezium' from correct work.
		3	

Question	Answer	Marks	Guidance
5(b)	Multiply *their* numerator and the given denominator by $3 + i$ and attempt to evaluate either	**M1**	Can have missing term and arithmetic errors but need $i^2 = -1$ once, seen or implied.
	Obtain numerator $8 + 6i$ or denominator 10	**A1**	
	State final answer $\frac{4}{5}+\frac{3}{5}i$ or $\frac{8}{10}+\frac{6}{10}i$ or $0.8 + 0.6i$	**A1**	Correct answer with no working scores 0/3.
	Alternative method for question (b)		
	Obtain two equations in x and y, and attempt to solve for x or for y	**M1**	$3 = 3x + y$ and $1 = -x + 3y$
	Obtain $x = \frac{4}{5}$ or $\frac{8}{10}$ or 0.8 $y = \frac{3}{5}$ or $\frac{6}{10}$ or 0.6	**A1**	
	State final answer $\frac{4}{5}+\frac{3}{5}i$ or $\frac{8}{10}+\frac{6}{10}i$ or $0.8 + 0.6i$	**A1**	Correct answer with no working scores 0/3.
		3	

Question	Answer	Marks	Guidance
(c)	State or imply $\arg \frac{u^*}{u} = \arg u^* - \arg u$ or $2\arg u^*$	**M1**	
	Justify the given statement correctly	**A1**	AG $\arg \frac{u^*}{u} = \tan^{-1} \frac{3}{4}$, $\arg u^* = \tan^{-1} \frac{1}{3}$ and $\arg u = \tan^{-1} -\frac{1}{3}$ (or $\arg u = -\tan^{-1} \frac{1}{3}$), needed if use first expression in M1; or $\arg \frac{u^*}{u} = \tan^{-1} \frac{3}{4}$ and $\arg u^* = \tan^{-1} \frac{1}{3}$, needed if use second expression in M1.
	Alternative method for question (c)		
	Use $\tan 2A$ formula with $\tan A = \frac{1}{3}$	**M1**	$\tan 2A = \frac{2\tan A}{1-\tan^2 A}$, $\tan A = \frac{1}{3}$, hence $\tan 2A = \frac{3}{4}$.
	Justify the given statement correctly	**A1**	AG So $2A = \tan^{-1} \frac{3}{4} = \arg \frac{u^*}{u}$ and $A = \tan^{-1} \frac{1}{3} = \arg u^*$ hence $\arg \frac{u^*}{u} = 2 \arg u^*$.
		2	