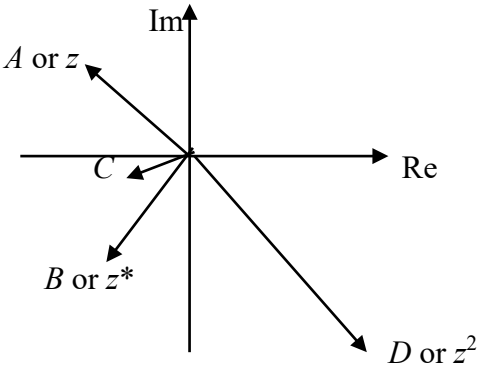
Question Number	Scheme	Marks
6(a)	$\lambda = 4$	B1 (1)
(b)	$\arctan\frac{3}{"4"}$ or $\arctan\frac{-3}{"4"}$	M1
	(Second quadrant so arg z = 2.498...) = 2.5 (rad)	A1 (2)
(c)(i)	$\frac{z+3\mathrm{i}}{2-4\mathrm{i}} = \frac{-4+6\mathrm{i}}{2-4\mathrm{i}} \times \frac{2+4\mathrm{i}}{2+4\mathrm{i}}$ or $\frac{z+3\mathrm{i}}{2-4\mathrm{i}} = a+\mathrm{i}b \Rightarrow -4+6\mathrm{i} = (a+\mathrm{i}b)(2-4\mathrm{i})$	M1
	$= \frac{-8+12\mathrm{i}-16\mathrm{i}+24\mathrm{i}^2}{4+16} = -\frac{8}{5}-\frac{1}{5}\mathrm{i}$ Accept e.g. $\frac{-32-4\mathrm{i}}{20}$	dM1A1
	Or $2a+4b=-4, 2b-4a=6 \Rightarrow a=.., b=..$	
(ii)	$z^2 = (-4+3\mathrm{i})^2 = 16-24\mathrm{i}+9\mathrm{i}^2 = 16-24\mathrm{i}-9$	M1
	$= 7-24\mathrm{i}$	A1ft (5)
(d)		B1 B1ft B1ft (3)
		[11]

(a)
B1 Correct answer. No working needed.

(b)
M1 For $\arctan\left(\pm\frac{3}{"4"}\right)$ with their "4". Can be awarded from $\tan\theta = \pm\frac{3}{"4"} \Rightarrow \theta = ...$ or by implication if correct value for either arctan or correct final answer (rounded or not rounded, may be degrees) is seen.

A1 Cao 2.5

(c)(i)
M1 Multiplies numerator and denominator by complex conjugate of denominator. Award if denominator of 4+16 or 20 is seen instead of product. May still have *z* at this stage, or even allow with $\lambda + 3\mathrm{i}$ as numerator.
Alternatively, sets equal to *a* + i*b* and cross multiplies.

dM1 Using their λ or 4 substitutes **correctly** for *z*, fully expands the numerator and uses $\mathrm{i}^2 = -1$
Alt, uses $\mathrm{i}^2 = -1$, equates real and imaginary terms and solves their equations for *a* and *b*

A1 Correct answer only, as shown or single fraction accepting equivalent fractions or with exact decimals (−1.6 − 0.2i).

(ii) M1 Squaring an expression of form $k + 3\mathrm{i}$ (with a real value for *k*) to get 3 terms (may be implied) and uses $\mathrm{i}^2 = -1$

A1ft Correct answer, follow through their $\lambda > 0$ (ie for $"\lambda^2 - 9" - "6\lambda"\mathrm{i}$ must be negative i term)

(d) NB: Penalise once only (in the first mark due) for mislabelling or failing to label points as long as they look to be placed correctly. Award if lines/arrows not included. Points may be labelled by letter, name or their Cartesian coordinates (which may be given on the axes).

B1 Plots *z* in second quadrant and *z** as mirror image in the Real axis. Both must be labelled.

B1ft Plot and label *C* for their solution to (c)(ii) It must be the correct side of *B* (for their

B1ft	answers) and a correct relative scale (so noticeably closer to O than their B if correct values). Plot and label their D (- 24 need not be to scale, but should be further from O than their B).