Question	Mark Scheme	Marks	AOs
5(a)	$3 - 2i$	B1	1.2
		(1)	
(b)	$-\alpha^2\beta\gamma = -52$ $(3-2i)(3+2i)\alpha^2 = 52$	M1	3.1a
	$13\alpha^2 = 52 \Rightarrow \alpha = ...$	M1	1.1b
	$\alpha = 2$	A1	2.2a
		(3)	
(c)	$f(z) = (z-2)(z+2)(z-(3+2i))(z-(3-2i))$ Alternative $\text{sum} = 2 + (-2) + (3+2i) + (3-2i) = \ldots \{6\}$ $\text{pair sum} = 2(-2) + 2(3+2i) + (2)(3-2i) + (-2)(3+2i) + (-2)(3-2i) + (3+2i)(3-2i) = \ldots \{9\}$ $\text{triple sum} = 2(-2)(3+2i) + 2(-2)(3-2i) + 2(3+2i)(3-2i) + (-2)(3+2i)(3-2i) = \ldots \{-24\}$	M1	3.1a
	$= (z^2-4)(z^2-6z+13)$ $= z^4 - 6z^3 + 9z^2 + 24z - 52$ $p = -6,\ q = 9,\ r = 24$	A1 A1	1.1b 1.1b
		(3)	
			(7 marks)

Notes

(a)

B1: Correct complex number

(b)

M1: Uses $3 \pm 2i$ and $-\alpha^2$ together with the product of roots = -52 to set up an equation in α

M1: Uses their equation to find a solution for α, must come from a quadratic.

A1: Correct value for α

(c)

M1: Uses ($z -$ their α) and ($z +$ their α) and their conjugate pair correctly as factors, and makes an attempt to expand

A1: Establishes at least 2 of the required coefficients correctly

A1: Correct quartic or correct constants

Alternatively

M1: Attempts to find the sum, pair sum and triple sum

A1: Establishes at least 2 of the required coefficients correctly

A1: Correct quartic or correct constants