Question Number	Scheme	Notes	Marks
2	$5x^2 - 2x + 3 = 0$		
(a)	$\alpha + \beta = \frac{2}{5}, \quad \alpha\beta = \frac{3}{5}$	Both correct	B1
			(1)
(b)(i)	$\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta$	Uses a correct identity	M1
	$= \left(\frac{2}{5}\right)^2 - 2\left(\frac{3}{5}\right) = -\frac{26}{25}$	Correct value (allow -1.04), even after $\alpha + \beta = -\frac{2}{5}$ in (a)	A1
(ii)	$\alpha^3 + \beta^3 = (\alpha + \beta)^3 - 3\alpha\beta(\alpha + \beta)$ or $\alpha^3 + \beta^3 = (\alpha + \beta)(\alpha^2 - \alpha\beta + \beta^2)$	Uses a correct identity	M1
	$= \left(\frac{2}{5}\right)^3 - 3\left(\frac{3}{5}\right)\left(\frac{2}{5}\right) = -\frac{82}{125}$	Correct value (allow -0.656)	A1
			(4)
(c)	$\text{Sum} = \alpha + \beta + \alpha^2 + \beta^2 = \frac{2}{5} - \frac{26}{25}\left(= -\frac{16}{25}\right)$	Attempts value of sum	M1
	$\text{Product} = \alpha\beta + \alpha^3 + \beta^3 + (\alpha\beta)^2 = \frac{3}{5} - \frac{82}{125} + \left(\frac{3}{5}\right)^2\left(= \frac{38}{125}\right)$	Attempts value of product, using the <u>correct</u> expansion of $(\alpha + \beta^2)(\beta + \alpha^2)$	M1
	$x^2 + \frac{16}{25}x + \frac{38}{125}(= 0)$	Applies x^2 – (their sum)x + their product Accept unsimplified versions. The '= 0' is not required	M1
	$125x^2 + 80x + 38 = 0$	Allow any integer multiple. Must be a fully correct equation, including the '= 0' Not just $p = 125$, $q = 80$, $r = 38$	A1
			(4)
			Total 9