Question	Scheme	Marks	AOs
2(a)	Attempts to substitute $\cos\theta \approx 1 - \frac{1}{2}\theta^2$ into either $1 + 4\cos\theta$ or $3\cos^2\theta$	M1	1.1b
	$1 + 4\cos\theta + 3\cos^2\theta \approx 1 + 4\left(1 - \frac{1}{2}\theta^2\right) + 3\left(1 - \frac{1}{2}\theta^2\right)^2$		
	$= 1 + 4\left(1 - \frac{1}{2}\theta^2\right) + 3\left(1 - \theta^2 + \frac{1}{4}\theta^4\right)$	M1	1.1b
	$= 1 + 4 - 2\theta^2 + 3 - 3\theta^2 + \frac{3}{4}\theta^4$		
	$= 8 - 5\theta^2$ *	A1*	2.1
		(3)	
(b)(i)	E.g. • Adele is working in degrees and not radians • Adele should substitute $\theta = \frac{5\pi}{180}$ and not $\theta = 5$ into the approximation	B1	2.3
(b)(ii)	$8 - 5\left(\frac{5\pi}{180}\right)^2 =$ awrt 7.962, so $\theta = 5°$ gives a good approximation.	B1	2.4
		(2)	
			(5 marks)

Question 2 Notes:

(a)(i)

M1: See scheme

M1: Substitutes $\cos\theta \approx 1 - \frac{1}{2}\theta^2$ into $1 + 4\cos\theta + 3\cos^2\theta$ and attempts to apply $\left(1 - \frac{1}{2}\theta^2\right)^2$

Note: It is not a requirement for this mark to write or refer to the term in θ^4

A1*: Correct proof with no errors seen in working.

Note: It is not a requirement for this mark to write or refer to the term in θ^4

(a)(ii)

B1: See scheme

(b)(i)

B1: See scheme

(b)(ii)

B1: Substitutes $\theta = \frac{5\pi}{180}$ or $\frac{\pi}{36}$ into $8 - 5\theta^2$ to give awrt 7.962 ***and*** an appropriate conclusion.