edexcel

June 2013
4PM0 Further Pure Mathematics
Mark Scheme

Question Number	Scheme	Marks
1.		
(a)	$\sin\theta = \frac{2}{6}$	M1A1
	$\sin\theta = \frac{1}{3}$	
	$\theta = 0.3398$	A1 (3)
(b)	Area of sector $= \frac{1}{2}r^2 \times 2\theta = \frac{1}{2}\times 64 \times 2\theta \quad (= 21.649...)$	M1
	Shaded area = sector $-\pi \times 2^2$, $= 9.18$	M1,A1 (3) [6]
2		
(a)	$\tan(A+B) = \frac{\sin(A+B)}{\cos(A+B)} = \frac{\sin A\cos B + \cos A\sin B}{\cos A\cos B - \sin A\sin B}$	M1
	$\div$ by $\cos A\cos B$	M1
	$= \frac{\tan A + \tan B}{1 - \tan A\tan B}$	A1 (3)
(b)	(i) $\tan 105 = \tan(60+45) = \frac{\tan 60 + \tan 45}{1 - \tan 60\tan 45} = \frac{\sqrt{3}+1}{1-\sqrt{3}}$	M1A1
	or see explicitly $\tan 60 = \sqrt{3}$ and $\tan 45 = 1$	
	(ii) $\tan 15 = \tan(60-45) = \frac{\tan 60 - \tan 45}{1 + \tan 60\tan 45} = \frac{\sqrt{3}-1}{1+\sqrt{3}}$	M1A1 (4)
		[7]