

5(a)

Use $\tan^4 \theta = \frac{\sin^4 \theta}{\cos^4 \theta}$ or $\tan^4 \theta - 1 = \left(\frac{\sin^2 \theta}{\cos^2 \theta} + 1 \right) + \left(\frac{\sin^2 \theta}{\cos^2 \theta} - 1 \right)$

Attempt to express $\tan^4 \theta - 1$ as a single fraction in terms of $\cos \theta$ only

Confirm result $\frac{1 - 2\cos^2 \theta}{\cos^4 \theta}$

Alternative Method for Question 5(a)

$$\frac{1 - 2\cos^2 \theta}{\cos^4 \theta} + \frac{\cos^4 \theta}{\cos^4 \theta} - 1$$

$$\frac{(1 - \cos^2 \theta)^2}{\cos^4 \theta} - 1$$

Confirm result $\tan^4 \theta - 1$

Alternative Method 2 for Question 5(a)

$$\tan^4 \theta = \sec^4 \theta - 2\sec^2 \theta + 1$$

$$\tan^4 \theta - 1 = \frac{1}{\cos^4 \theta} - \frac{2}{\cos^2 \theta}$$

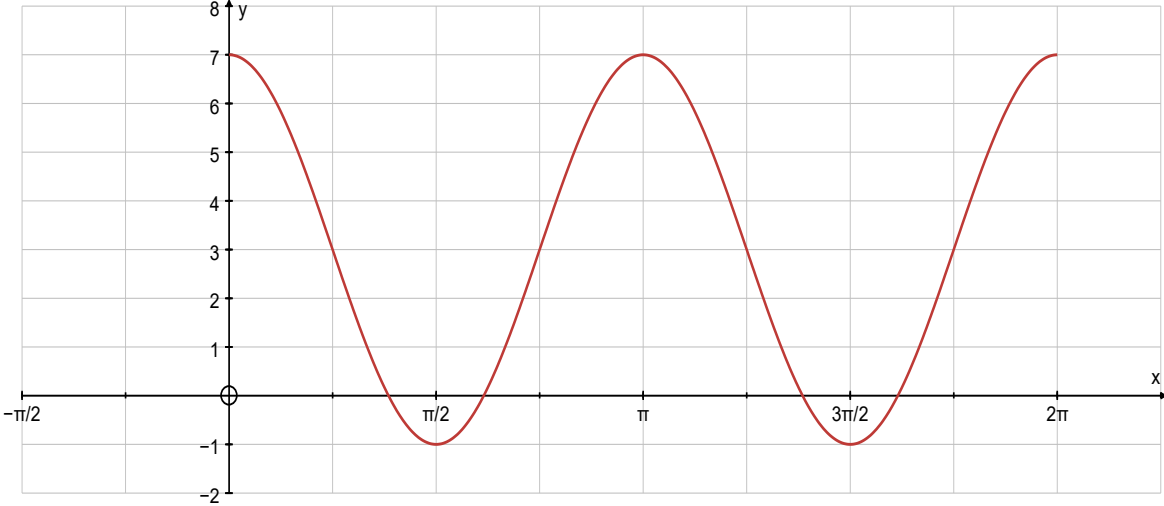
Confirm result $\frac{1 - 2\cos^2 \theta}{\cos^4 \theta}$

5(b)	Use identity to form equation using $\cos \theta$ only
	Obtain $9\cos^2 \theta = 1$ or similarly simplified equivalent
	Solve equation of form $\cos^2 \theta = k$ to obtain at least one solution
	Obtain 70.5 and 109.5

6(a)	
6(b)(i)	1
6(b)(ii)	3

6(c)	$3\sin x + 2 = 5(1 - \sin^2 x) - 1$
	$5\sin^2 x + 3\sin x - 2 \quad [= 0]$
	$\sin x = 0.4 \text{ and } -1$
	$x = 0.41, 2.73, \frac{3}{2}\pi \text{ AWRT}$ or $0.13\pi, 0.87\pi, 1.5\pi$ or $\frac{59}{450}\pi, \frac{391}{450}\pi, \frac{3}{2}\pi$

1	$6\sin^2 \theta - \sin \theta - 2 [= 0] \Rightarrow [(2\sin \theta + 1)(3\sin \theta - 2) = 0]$
	$\sin \theta = -\frac{1}{2} \text{ or } \sin \theta = \frac{2}{3}$
	$\theta = -150^\circ, -30^\circ, 41.8^\circ, 138.2^\circ$

5(a)	[Greatest] 7, [least] -1
5(b)	
5(c)	3 [solutions]

7(a)	For appropriate use of $\tan \theta = \frac{\sin \theta}{\cos \theta}$ or $\tan \theta \cos \theta = \sin \theta$ at least once
	For appropriate use of $\sin^2 \theta + \cos^2 \theta = 1$ or $1 + \tan^2 \theta = \sec^2 \theta$
	Fully correct proof
7(b)	$\frac{\tan \theta + 7}{\tan^2 \theta - 3} = \frac{5}{\tan \theta} \Rightarrow \tan \theta (\tan \theta + 7) = 5(\tan^2 \theta - 3)$
	$\Rightarrow 4 \tan^2 \theta - 7 \tan \theta - 15 = 0 \Rightarrow (4 \tan \theta + 5)(\tan \theta - 3) = 0$
	$\tan \theta = -1.25$ and $\tan \theta = 3$
	$\theta = 71.6^\circ$ and $\theta = 128.7^\circ$