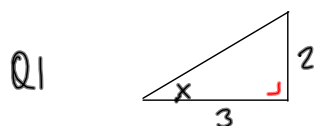


Test on Trigonometry 2

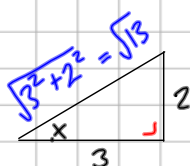
T&T4 Chapter 5

18-11-2013



What is the value of $\sin 2x$

$$\sin 2A = 2 \sin A \cos A$$



$$\sin A = \frac{2}{\sqrt{13}}$$

$$\cos A = \frac{3}{\sqrt{13}}$$

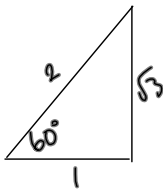
$$\sin 2A = 2 \left(\frac{2}{\sqrt{13}} \right) \left(\frac{3}{\sqrt{13}} \right) = \frac{12}{13}$$

Q2 (i) Simplify $\sin 75^\circ \cos 15^\circ - \cos 75^\circ \sin 15^\circ$

$$\sin(A-B) = \sin A \cos B - \cos A \sin B$$

$$A = 75^\circ$$

$$B = 15^\circ$$



$$\begin{aligned} \sin 75^\circ \cos 15^\circ - \cos 75^\circ \sin 15^\circ \\ = \sin(75^\circ - 15^\circ) = \sin 60^\circ \end{aligned}$$

$$\sin 60^\circ = \frac{\sqrt{3}}{2}$$

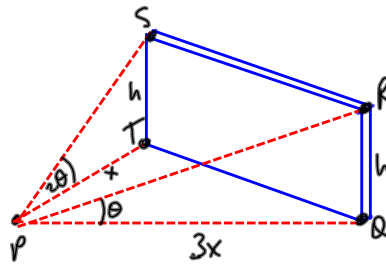
Q2 (ii) Prove. $2 + 2\cos 2x = 4\cos^2 x$

$$\cos^2 A = \frac{1}{2}(1 + \cos 2A)$$

$$\begin{aligned} \Rightarrow 4\cos^2 A &= 4\left[\frac{1}{2}(1 + \cos 2A)\right] \\ &= 2(1 + \cos 2A) \\ &= 2 + 2\cos 2A \end{aligned}$$

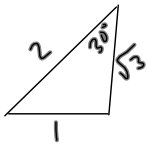
Q3

$\theta = ?$



$$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

Let $\tan \theta = t$



$$\tan \theta = \frac{h}{3x} \qquad \tan 2\theta = \frac{h}{x}$$

$$\Rightarrow 3 \tan \theta = \tan 2\theta$$

$$\Rightarrow 3 \tan \theta = \frac{2 \tan \theta}{1 - \tan^2 \theta}$$

$$\Rightarrow 3(1 - \tan^2 \theta) = 2$$

$$1 - \tan^2 \theta = \frac{2}{3}$$

$$-\tan^2 \theta = \frac{2}{3} - 1 = -\frac{1}{3}$$

$$\tan^2 \theta = \frac{1}{3}$$

$$\tan \theta = \sqrt{\frac{1}{3}} = \frac{1}{\sqrt{3}}$$

$$\Rightarrow \theta = 30^\circ$$