

**UNIT 6 MCR 3UI Exam Review**

1. Fill in the blanks below and graph the following sinusoidal function for one cycle.

$$y = 4 \cos(2x - 60^\circ) + 5$$

$$= 4 \cos 2(x - 30^\circ) + 5$$

a k c      period =  $\frac{360^\circ}{k}$

Amplitude: 4

Period: 180°

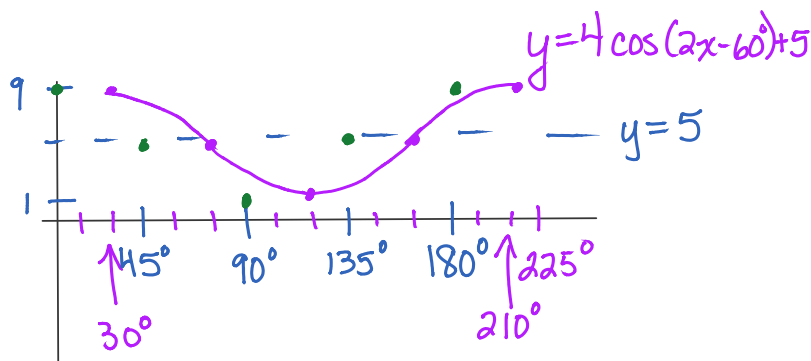
Phase Shift: right 30°

Vertical Shift: up 5

Minimum Value: 1

Maximum Value: 9

$4 + \text{shift up } 5 \quad 4 + 5 = 9 \text{ Max}$   
 $-4 + \quad \quad \quad -4 + 5 = 1 \text{ Min}$

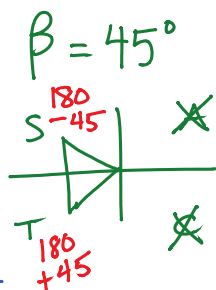


2. Solve for  $\theta$ ,  $0^\circ \leq \theta \leq 360^\circ$

a)  $\sqrt{2}\cos\theta + 1 = 0$

$$\sqrt{2}\cos\theta = -1$$

$$\cos\theta = \frac{-1}{\sqrt{2}}$$



$$\therefore \theta = 135^\circ \text{ or } 225^\circ$$

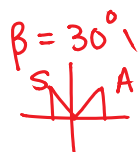
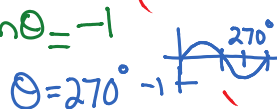
b)  $2\sin^2\theta + \sin\theta - 1 = 0$

$$(2\sin\theta - 1)(\sin\theta + 1) = 0 \quad \checkmark$$

$$2\sin\theta - 1 = 0 \quad \text{or} \quad \sin\theta + 1 = 0$$

$$\sin\theta = \frac{1}{2}$$

$$\sin\theta = -1$$



$$\theta = 30^\circ \text{ or } 150^\circ$$

$$\therefore \theta = 30^\circ, 150^\circ \text{ or } 270^\circ$$



$$\begin{aligned} \sin 45^\circ &= \frac{1}{\sqrt{2}} \\ \cos 45^\circ &= \frac{1}{\sqrt{2}} \\ \tan 45^\circ &= 1 \end{aligned}$$



$$\begin{aligned} \sin 30^\circ &= \frac{1}{2} & \sin 60^\circ &= \frac{\sqrt{3}}{2} \\ \cos 30^\circ &= \frac{\sqrt{3}}{2} & \cos 60^\circ &= \frac{1}{2} \\ \tan 30^\circ &= \frac{1}{\sqrt{3}} & \tan 60^\circ &= \sqrt{3} \end{aligned}$$