

$$93) I = k \cos^2 \theta$$

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a.) Write I in terms of $\sin(\theta)$

$$I = k \cos^2 \theta \\ = k(1 - \sin^2 \theta)$$

b.) Max value occurs at $\theta = 0$ because at $\theta = 0$, $\cos(\theta) = 1$, the maximum value of the cosine function.

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$$5) \cos(75^\circ) = \cos(45^\circ + 30^\circ) = \cos(45^\circ)\cos(30^\circ) - \sin(45^\circ)\sin(30^\circ) \\ = \frac{\sqrt{2}}{2} \left(\frac{\sqrt{3}}{2} \right) - \frac{\sqrt{2}}{2} \left(\frac{1}{2} \right)$$

$$7) \cos(105^\circ) = \cos(60^\circ + 45^\circ) = \cos(60^\circ)\cos(45^\circ) - \sin(60^\circ)\sin(45^\circ) \\ = \frac{1}{2} \frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2} \frac{\sqrt{2}}{2}$$

$$\frac{\pi}{4} + \frac{\pi}{3} = \frac{3\pi}{12} + \frac{4\pi}{12}$$

$$9) \cos\left(\frac{7\pi}{12}\right) = \cos\left(\frac{3\pi}{12} + \frac{4\pi}{12}\right) = \cos\left(\frac{\pi}{4} + \frac{\pi}{3}\right) \\ = \cos\left(\frac{\pi}{4}\right)\cos\left(\frac{\pi}{3}\right) - \sin\left(\frac{\pi}{4}\right)\sin\left(\frac{\pi}{3}\right) \\ = \frac{\sqrt{2}}{2} \left(\frac{1}{2} \right) - \frac{\sqrt{2}}{2} \left(\frac{\sqrt{3}}{2} \right)$$

$$11) \cos(40^\circ)\cos(50^\circ) - \sin(40^\circ)\sin(50^\circ) \\ = \cos(40^\circ + 50^\circ) = \cos(90^\circ) = 0$$