

6.5 - Find the phase shift and vertical shift for sine and cosine functions.

Review

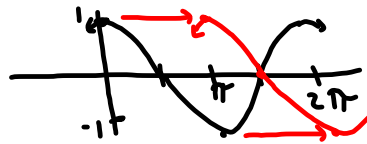
$y = \cos 2\theta \rightarrow \text{period } \frac{2\pi}{2} = \pi$

$y = 2 \cos \theta \rightarrow \text{Amplitude} = 2$
(height)

$y = -\cos \theta \sim \text{Flips}$

Phase Shift $\rightarrow y = A \cos(k\theta + c)$
 $y = A \sin(k\theta + c) \sim -\frac{c}{k}$, IF $c > 0$, Shift left
 IF $c < 0$, Shift right

$\frac{2\pi}{k} y = \cos(\theta - \pi)$ $-\frac{-\pi}{1} = \pi$
 $\uparrow \quad \uparrow$
 $k=1 \quad c=-\pi$



#16 $y = 2 \cos\left(\frac{\theta}{4} + \frac{\pi}{2}\right)$

Amplitude = 2
 Period = $\frac{2\pi}{k} = \frac{2\pi}{1/4} = 8\pi$
 P.S. = $-\frac{c}{k} = -\frac{\pi/2}{1/4} = -2\pi$

Vertical Shift $\rightarrow y = A \sin(k\theta + c) + h$
 $y = A \cos(k\theta + c) + h$

IF $h > 0$, shift upward
 IF $h < 0$, shift downward
 Midline is $y = h$

#8 $y = 2 \sin(2\theta + \pi) - 5$

Ampl. = 2
 Period = $\frac{2\pi}{2} = \pi$
 P.S. = $-\frac{c}{k} = -\frac{\pi}{2}$
 V.S. = -5
 Midline is $y = -5$