

4.5 (part 3) | Translations of Sine & Cosine

PE
MD
AS
amplitude
period
translations

$$y = A \sin(Bx - C) + D$$

aka $y = A \sin(k\theta + c) + h$

* vertical shift = D

* phase shift = $\frac{C}{B}$ aka horizontal shift

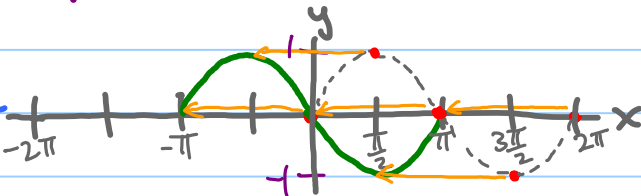
ex 1) State the phase shift & graph the function

a) $y = \sin(x + \pi)$

$A=1$ $B=1$ $C=-\pi$

phase shift = $\frac{C}{B} = \frac{-\pi}{1} = -\pi \rightarrow$ shifts left

Check amplitude & period!



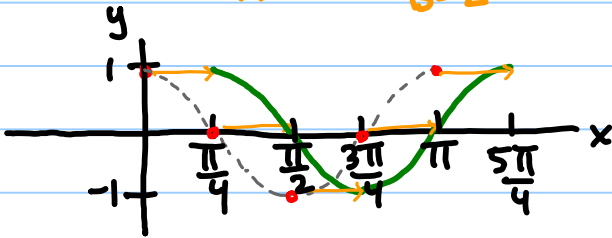
b) $y = \cos(2\theta - \frac{\pi}{2})$

$A=1$ $B=2$ $C=\frac{\pi}{2}$

P.S. = $\frac{\pi}{2} = \frac{\pi}{4}$ shifts right

amp: $|1| = 1$

period: $\frac{2\pi}{2} = \pi$



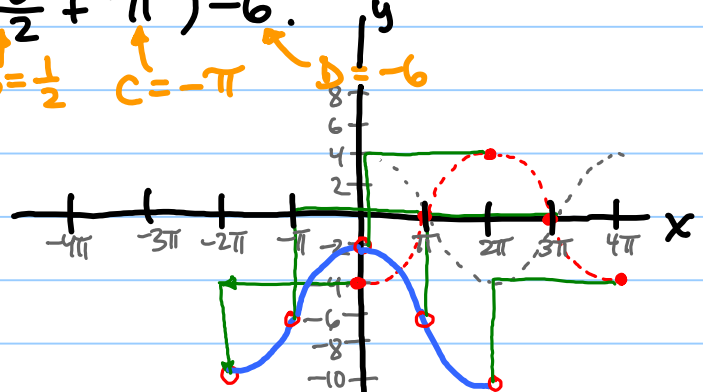
ex 2) State the amplitude, period, phase shift, & vertical shift for $y = -4 \cos(\frac{\theta}{2} + \pi) - 6$.

* amplitude: $|-4| = 4$

* period: $\frac{2\pi}{\frac{1}{2}} = 4\pi$

phase shift: $\frac{C}{B} = \frac{-\pi}{\frac{1}{2}} = -2\pi$ left

vert. shift: -6 down



Hw: p 533 # 18-30 even, 44-60 even