

Determine the amplitude, period, and phase shift for each function..

1.  $y = 3\sin(4x)$

Amp = 3

Per =  $\frac{\pi}{2}$

Phase Shift = N/A

2.  $y = -2\cos(2x + \frac{\pi}{2})$

Amp = 2

Per =  $\pi$

Phase Shift = left  $\frac{\pi}{4}$

3.  $y = \sin(\pi x - \pi)$

Amp = 1

Per = 2

Phase Shift = right 1

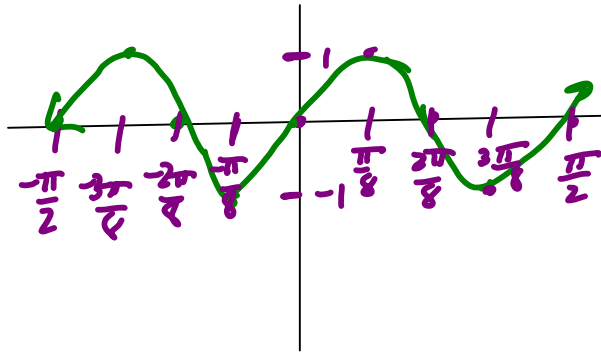
Graph the following functions over a 2 period cycle. Label all needed parts.

4.  $y = \sin(4x)$

Amp = 1  
Period =  $\frac{\pi}{2}$

Phase Shift = N/A  
Vertical shift: N/A

Range = [-1, 1]

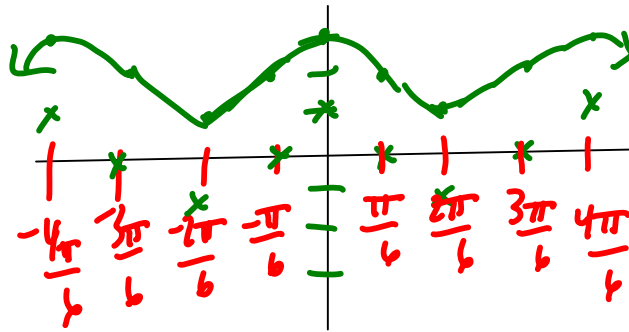


5.  $y = 2 + \cos(3x)$

Amp = 1  
Period =  $\frac{2\pi}{3}$

Phase Shift = N/A  
Vertical shift: up 2

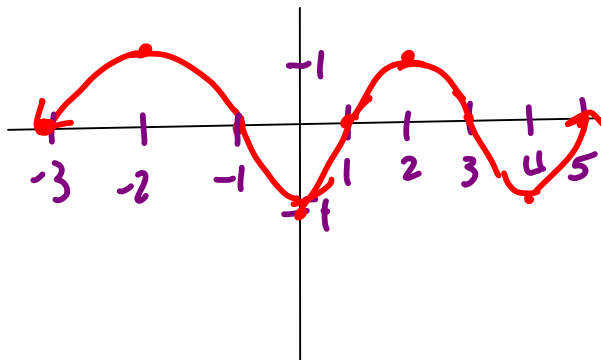
Range = [1, 3]



6.  $y = \sin(\frac{\pi}{2}x + \frac{3\pi}{2})$

Amp = 1  
Period = 4

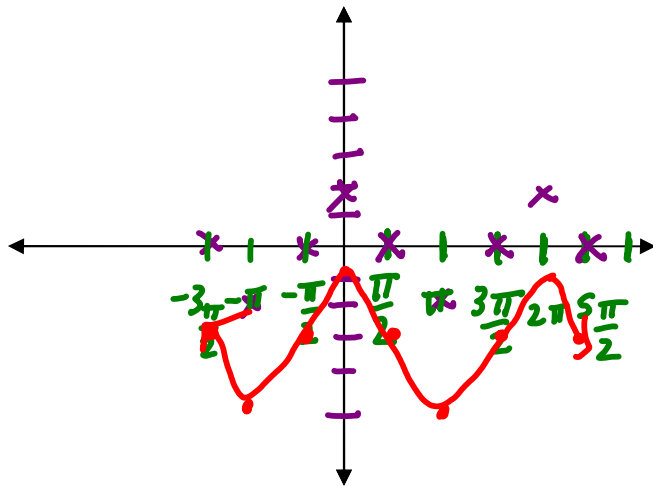
Phase Shift = left 3  
Vertical shift: N/A  
Range = [-1, 1]



#7 & 8. Determine the amplitude, period, phase shift, and range. Then sketch 2 periods (Label both axes).

7.  $y = -3 - 2 \sin(x - \frac{\pi}{2})$

Amp: 2  
 Period:  $2\pi$   
 Phase Shift: right  $\frac{\pi}{2}$   
 Vertical Shift: down 3  
 Range: [-5, -1]



$$0 \leq x - \frac{\pi}{2} \leq 2\pi$$

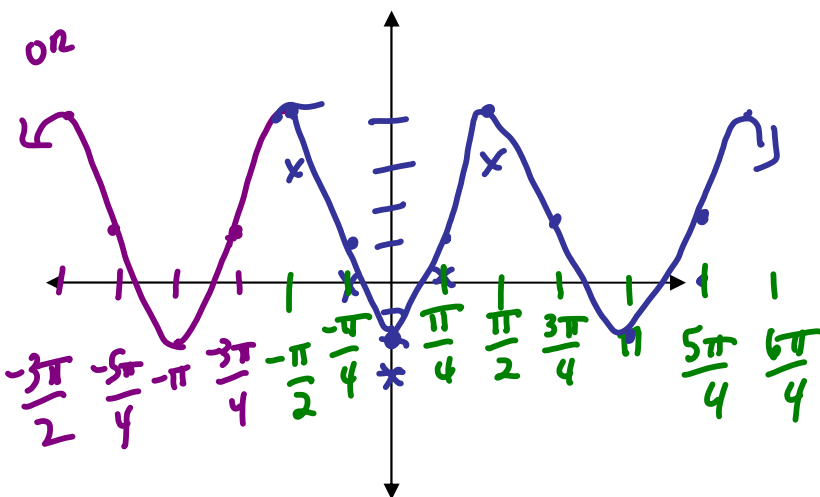
$$\frac{\pi}{2} \leq x \leq \frac{5\pi}{2}$$

$$\frac{\pi}{2}, \frac{3\pi}{2}, \frac{2\pi}{2}$$

8.  $y = 1 + 3 \cos(2x + \pi)$  (Hint: Rewrite in the form:  $y = A \cos B(x - C) + D$ )

$1 + 3 \cos 2(x + \frac{\pi}{2})$

Amp: 3  
 Period:  $\pi$   
 Phase Shift: left  $\frac{\pi}{2}$   
 Vertical Shift: up 1  
 Range: [-2, 4]



$$0 \leq x + \frac{\pi}{2} \leq \pi$$

$$-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$$