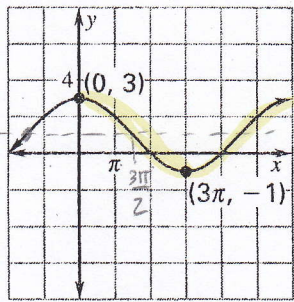
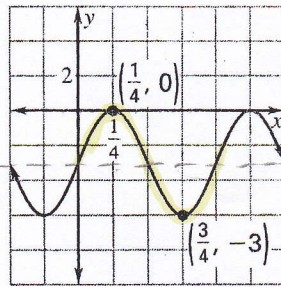


Find the sine and cosine functions of each graph.

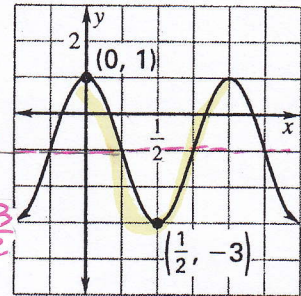
1.



$Per = 6\pi = \frac{2\pi}{B}$
 $6B\pi = 2\pi$
 $B = \frac{2\pi}{6\pi} = \frac{1}{3}$



$Max = 0$
 $Min = -3$
 $Amp = \frac{0 - (-3)}{2} = \frac{3}{2}$
 $AOW: y = \frac{0 - (-3)}{2} = \frac{3}{2}$

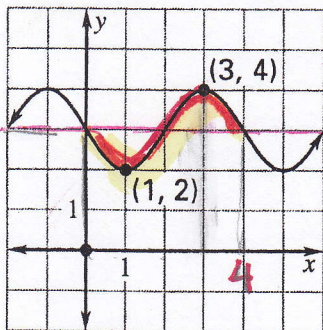


$Max = 1$
 $Min = -3$
 $A = \frac{1 - (-3)}{2} = 2$
 $AOW: y = \frac{1 - (-3)}{2} = 1$

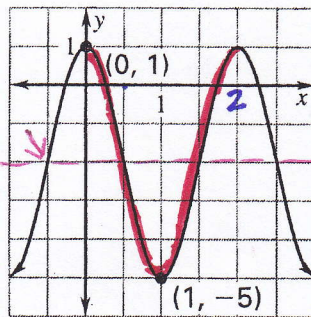
$Max = 3 ; Min = -1$
 $Amp = \frac{3 - (-1)}{2} = 2 ; AOW: y = 1$
 $AOW: y = \frac{3 - (-1)}{2} = 1$
 $y = 2 \cos \frac{1}{3}(x) + 1$
 $y = -2 \sin \frac{1}{3}(x - \frac{3\pi}{2}) + 1$

$Per = \frac{1}{4} = \frac{2\pi}{B} \rightarrow B = 2\pi$
 $y = \frac{3}{2} \sin 2\pi x - \frac{3}{2}$
 $y = \frac{3}{2} \cos 2\pi(x - \frac{1}{4}) - \frac{3}{2}$

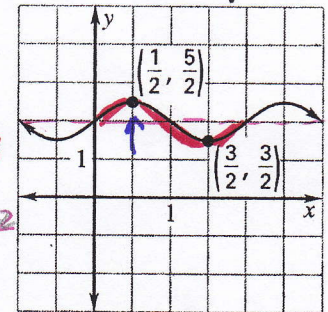
$Per = 1 = \frac{2\pi}{B} \rightarrow B = 2\pi$
 $y = 2 \cos 2\pi x - 1$
 $y = -2 \sin 2\pi(x - \frac{1}{4}) - 1$



$Max = 4$
 $Min = 2$
 $Per = 4 = \frac{2\pi}{B}$
 $4B = 2\pi$
 $B = \frac{\pi}{2}$



$Max = 1$
 $Min = -5$
 $Amp = \frac{1 - (-5)}{2} = 3$
 $AOW: y = \frac{1 - (-5)}{2} = -2$
 $Per = 2 = \frac{2\pi}{B}$



$2B = 2\pi \rightarrow B = \pi$
 $Max = \frac{5}{2}$
 $Min = \frac{3}{2}$
 $Amp = \frac{\frac{5}{2} - \frac{3}{2}}{2} = \frac{1}{2}$
 $AOW: y = \frac{\frac{5}{2} + \frac{3}{2}}{2} = 2$

$Amp = \frac{4 - 2}{2} = 1 ; AOW: y = \frac{4 + 2}{2} = 3$

$y = 3 \cos \pi x - 2$
 $y = 3 \sin \pi(x + 0.5) - 2$

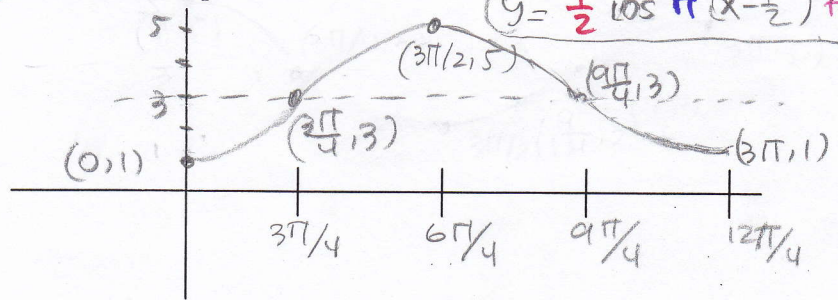
$y = -1 \sin \frac{\pi}{2}(x) + 3$
 $y = -1 \cos \frac{\pi}{2}(x - 1) + 3$

$Per = 2 = \frac{2\pi}{B} \rightarrow B = \pi$
 $y = \frac{1}{2} \sin \pi x + 2$
 $y = \frac{1}{2} \cos \pi(x - \frac{1}{2}) + 2$

Graph each function. Identify the amplitude, period, AOW & phase shift.

3. $y = 3 - 2 \cos \frac{2}{3}x$

$A = -2$
 $AOW = y = 3$
 $B = \frac{2}{3} \quad \frac{2\pi}{\frac{2}{3}} = 3\pi$
 $Per = 3\pi$
 $Scale: \frac{3\pi}{4}$
 $Phase shift: none$



4. $y = 1 - 2\sin\frac{1}{2}(x + \pi)$

$A = -2$

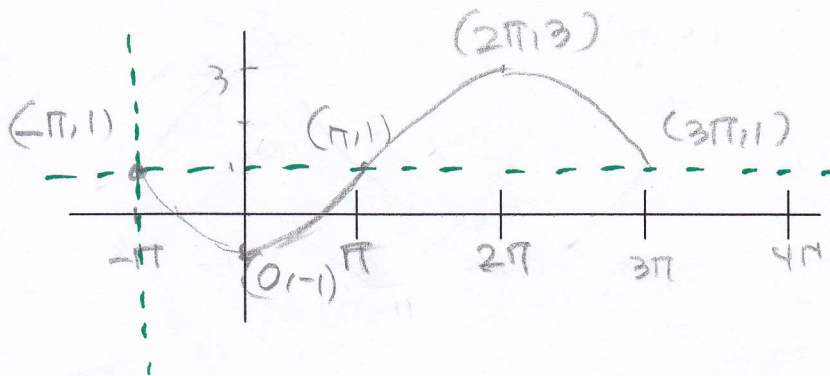
AOW = $y = 1$

$B = \frac{1}{2}$

Per = $2\pi \div \frac{1}{2} = 4\pi$

Scale: π

Phase shift $|\text{left}| \pi$



5 - 8: Solve for $0 \leq x < 2\pi$

5. $2\sin x = \sqrt{3}$

$\sin x = \sqrt{3}/2$ Q I, II

$x = \frac{\pi}{3}$

$x = \frac{2\pi}{3}$

$n=0 - \frac{\pi}{12}; \frac{2\pi}{12} = \frac{\pi}{6}$

$n=1 - \frac{7\pi}{12}; \frac{8\pi}{12} = \frac{2\pi}{3}$

$n=2 - \frac{13\pi}{12}; \frac{14\pi}{12} = \frac{7\pi}{6}$

$n=3 - \frac{19\pi}{12}; \frac{20\pi}{12} = \frac{5\pi}{3}$

6. $2\sin 4x = \sqrt{3}$ for.

$\sin 4x = \frac{\sqrt{3}}{2}$

$4x = \frac{\pi}{3} + 2n\pi$

$x = \frac{\pi}{12} + \frac{2n\pi}{4} \cdot 3$

$= \frac{\pi}{12} + \frac{6n\pi}{12}$

$4x = \frac{2\pi}{3} + 2n\pi$

$x = \frac{2\pi}{12} + \frac{2n\pi}{4} \cdot 3$

$= \frac{2\pi}{12} + \frac{6n\pi}{12}$

7. $2\sin\frac{1}{2}x = \sqrt{3}$

$\sin\frac{1}{2}x = \frac{\sqrt{3}}{2}$

$\frac{1}{2}x = \frac{\pi}{3} + 2n\pi$

$x = \frac{2\pi}{3} + 4n\pi$

$\frac{1}{2}x = \frac{2\pi}{3} + 2n\pi$

$x = \frac{4\pi}{3} + 4n\pi$

$\frac{2\pi}{3}, \frac{4\pi}{3}$

8. $2\cos\left(\frac{1}{3}x\right) = 1$ for $0 \leq x < 2\pi$.

$\cos\frac{1}{3}x = \frac{1}{2}$

$\frac{1}{3}x = \frac{\pi}{3} + 2n\pi$

$x = \pi + 6n\pi$

$\frac{1}{3}x = \frac{5\pi}{3} + 2n\pi$

$x = 5\pi + 6n\pi$

π

9. Find the angle of inclination of the line joining (5, -2) and (-3, 1)

$m = \frac{1 - (-2)}{-3 - 5} = \frac{3}{-8} = -\frac{3}{8}$ (obtuse) $\theta = 180^\circ - \tan^{-1}\left(\frac{3}{8}\right)$
 159.44°

10. Find the slope and the equation of a line with inclination 30° and contains (-6, 2).

$m = \tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

$y - 2 = \frac{\sqrt{3}}{3}(x + 6)$

$y - 2 = \frac{\sqrt{3}}{3}x + 2\sqrt{3} \rightarrow y = \frac{\sqrt{3}}{3}x + 2 + 2\sqrt{3}$