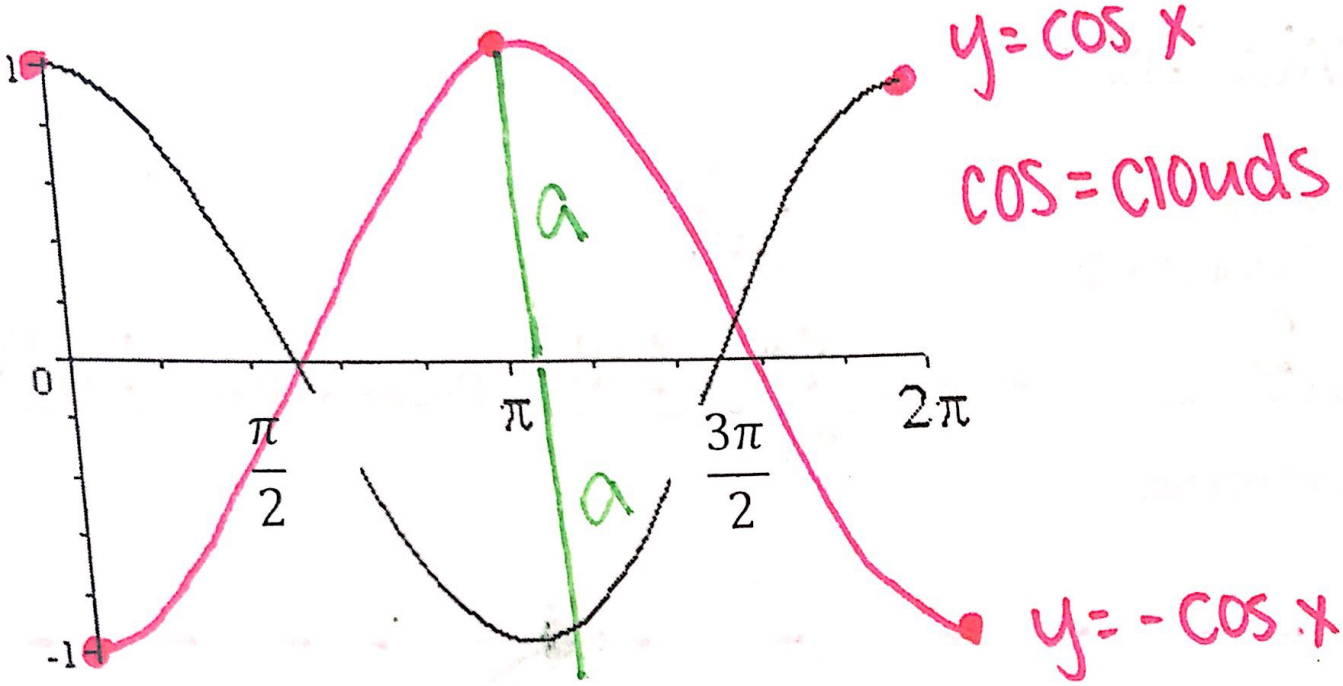
Graphing the Cosine Function



ne Graph

Remember: Cosine Commences in the clouds. This means it should start & end above or below the midline

Day 11 Classwork

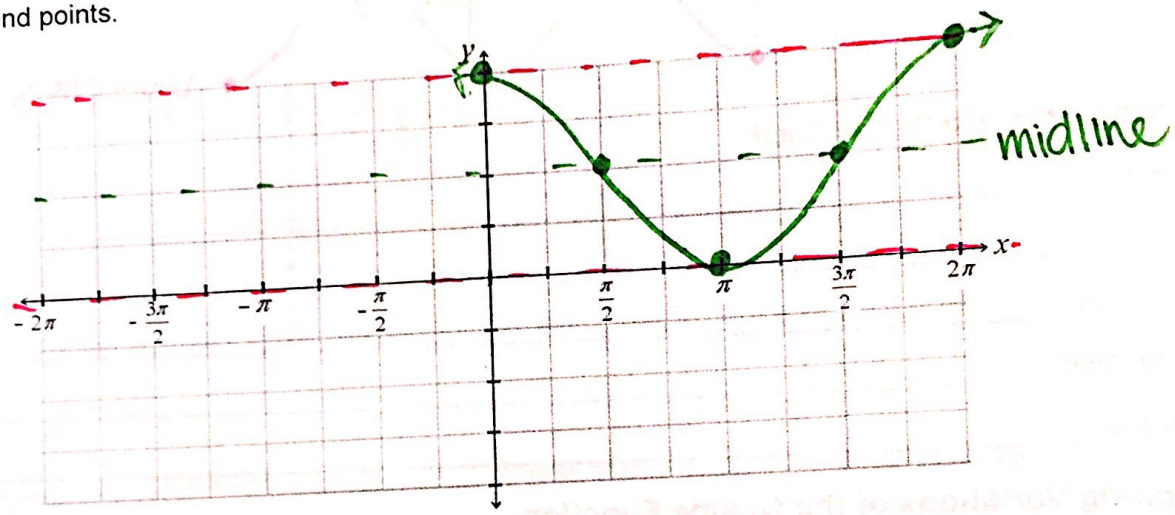
1. Graph $y = 2\cos(x) + 2$

b=1

Amplitude = 2 Period = $\frac{2\pi}{1} = 2\pi$ Phase shift = none Vertical Shift = up 2

Find the start/end points.

(0, 4)
($\frac{\pi}{2}$, 2)
(π, 0)
(3π, 2)



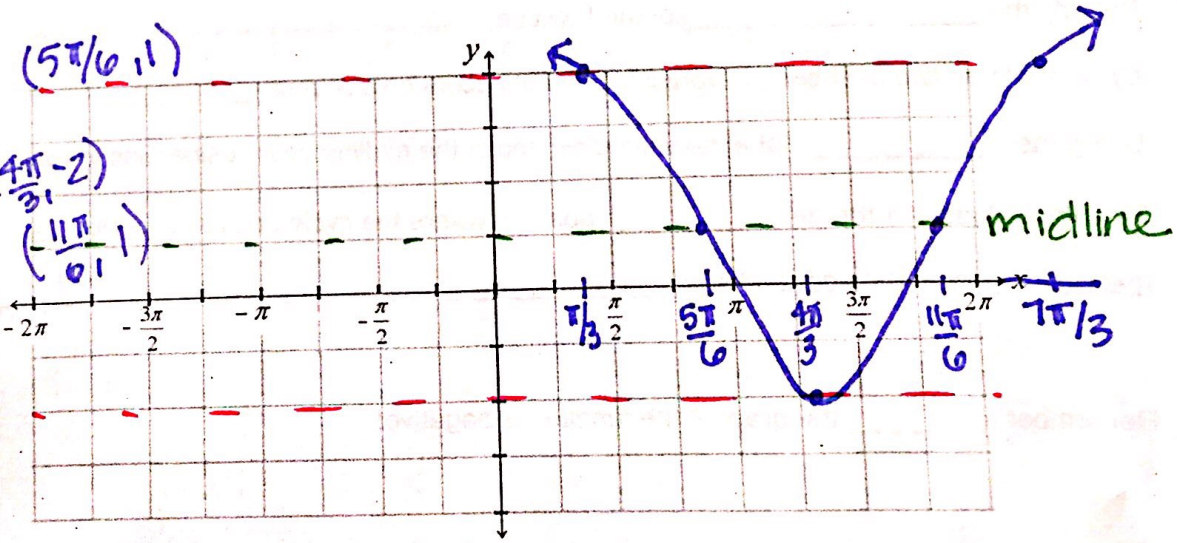
2. $y = 3\cos(x - \frac{\pi}{3}) + 1$

b=1

Amplitude = 3 Period = $\frac{2\pi}{1} = 2\pi$ Phase shift = right $\pi/3$ Vertical Shift = up 1

Find the start/end points.

1. ($\pi/3$, 4)
2. $\pi/2 + \pi/3 = \frac{5\pi}{6}$ ($5\pi/6$, 1)
3. $\pi + \frac{\pi}{3} = \frac{4\pi}{3}$ ($\frac{4\pi}{3}$, -2)
4. $\frac{3\pi}{2} + \frac{\pi}{3} = \frac{11\pi}{6}$ ($\frac{11\pi}{6}$, 1)
5. $2\pi + \frac{\pi}{3} = \frac{7\pi}{3}$ ($7\pi/3$, 4)

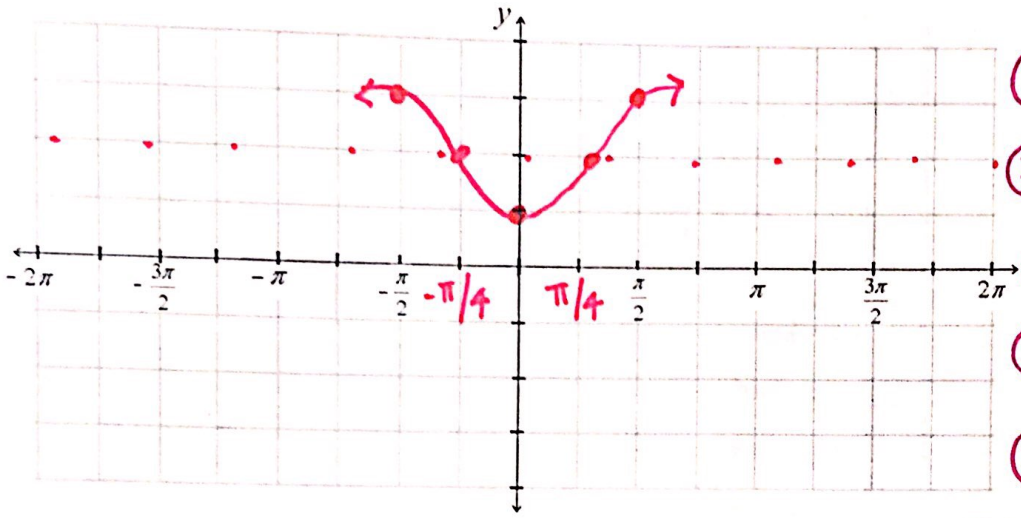


Mixed Practice

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

Amplitude = 1 Period = $b=2$ $\frac{2\pi}{2} = \pi$ Phase shift = left $\pi/2$ Vertical Shift = up 2

Find the start/end points.



① $(-\frac{\pi}{2}, 3)$

② $(-\pi/4, 2)$

③ $(0, 1)$

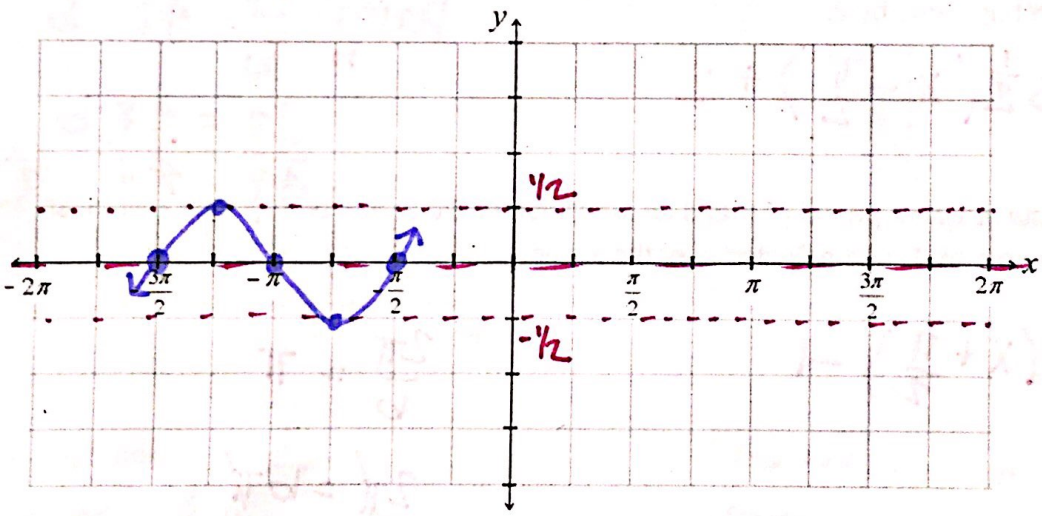
④ $(+\pi/4, 2)$

⑤ $(\frac{\pi}{2}, 3)$

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

Amplitude = $\frac{1}{2}$ Period = $\frac{2\pi}{2} = \pi$ Phase shift = left $\frac{3\pi}{2}$ Vertical Shift = none

Find the start/end points.



midline

$\frac{-3\pi}{2} + \frac{\pi}{1} = \frac{-3\pi}{2} + \frac{2\pi}{2} = \frac{-\pi}{2}$

$\frac{-4\pi}{4} - \frac{\pi}{4} = \frac{-5\pi}{4}$

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

① $(\frac{-3\pi}{2}, 0)$

② $(\frac{-5\pi}{4}, 1/2)$

③ $(-\pi, 0)$

④ $(\frac{-3\pi}{4}, -1/2)$

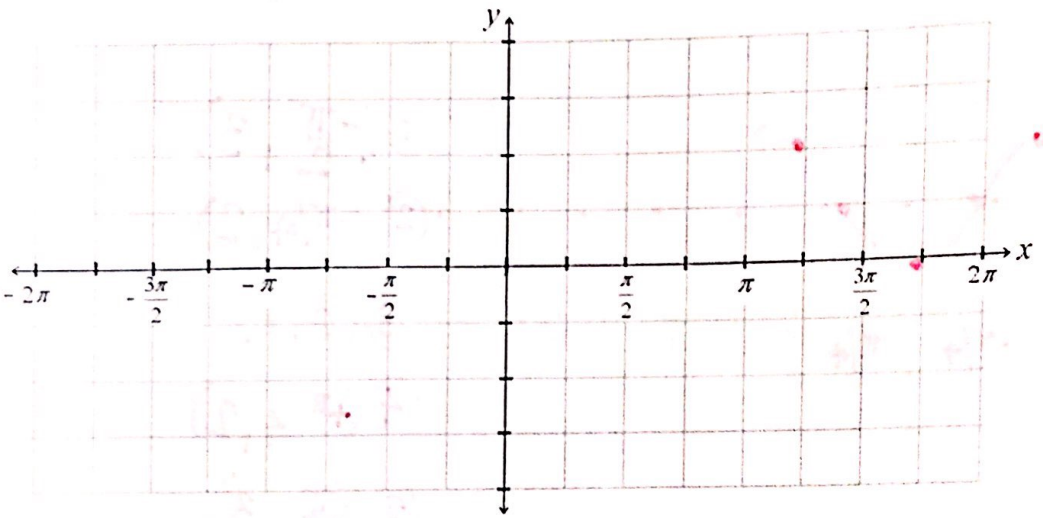
⑤ $(-\pi/2, 0)$

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

$\underline{2}$

Amplitude = _____ Period = _____ Phase shift = _____ Vertical Shift = _____

Find the start/end points.



Write the sine or cosine function given the transformations.

4. Write an equation for a cosine curve with a period of 4π and an amplitude of 3 that has been phase shifted right by $\frac{\pi}{2}$ and vertically displaced upwards by 2.

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

period: $\frac{2\pi}{b} = 4\pi \cdot b$

$\frac{2\pi}{4\pi} = \frac{4\pi b}{4\pi}$

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

5. Write an equation for a sine curve with a period of π and an amplitude of 2 that has been phase shifted left by $\frac{\pi}{2}$, vertically displaced downwards by 1, and reflected over the x axis.

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

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

$2\pi = b\pi$

$2 = b$