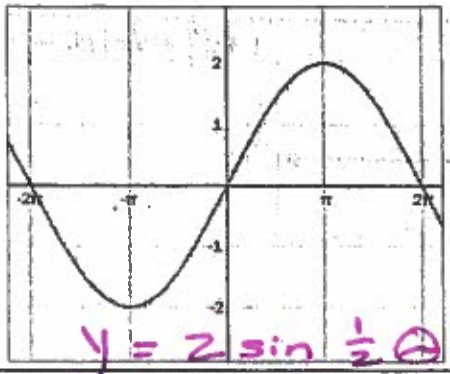
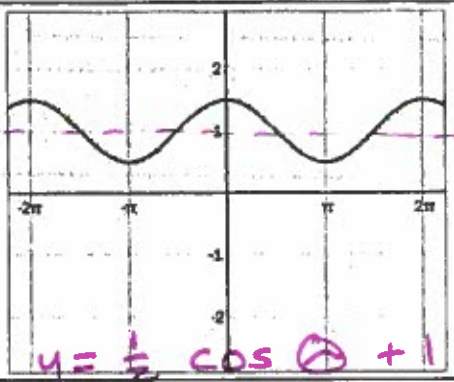
Station 1: Writing Equations from Graphs

WRITE THE EQUATION FROM THE GRAPH.

Per = 4π
$b = \frac{1}{2}$
$a = 2$

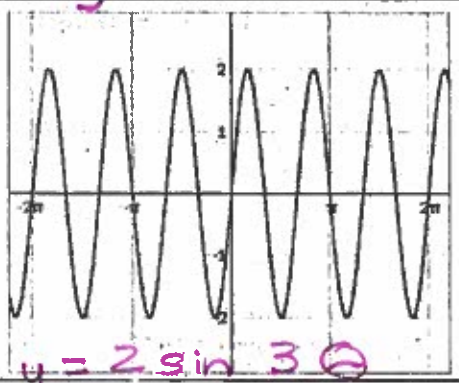
1. 

$y = 2\sin\frac{1}{2}\theta$

2. 

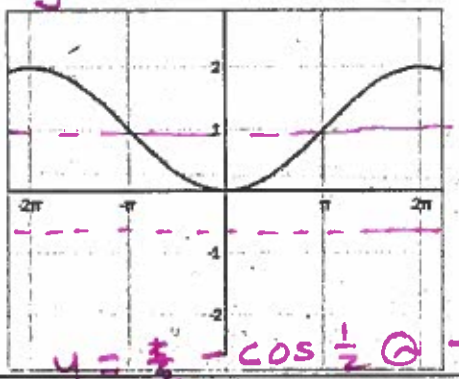
$y = \frac{1}{2}\cos\theta + 1$

$a = 2$
Per = $\frac{2\pi}{3}$

3. 

$y = 2\sin 3\theta$

Per = 4π
$b = \frac{1}{2}$
$a = 1$

4. 

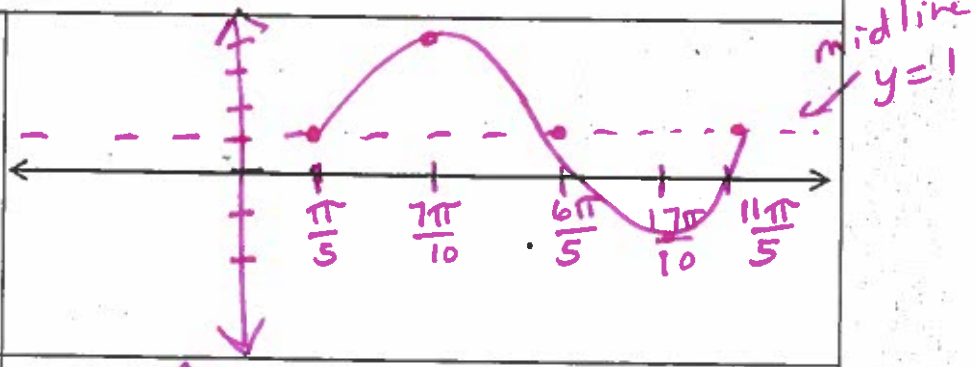
$y = \frac{1}{2}\cos\frac{1}{2}\theta + 1$

Station 2: Graphing Sine and Cosine

Graph 2 full periods of each function. Label the scale on both axes and identify key information: period, amplitude, phase shift, vertical displacement, reflection, and what you will count by on the x-axis.

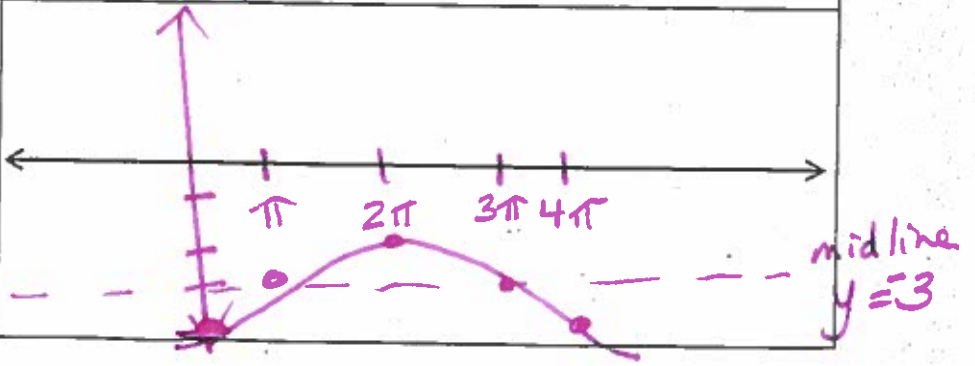
1. $y = 3\sin\left(x - \frac{\pi}{5}\right) + 1$

Amplitude: 3
Period: 2π
Phase Shift: right $\frac{\pi}{5}$
Vertical Displacement: +1
Reflection: Yes / No
Count: by $\frac{\pi}{2}$ or $\frac{5\pi}{10}$



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

Amplitude: 1
Period: 4π
Phase Shift: none
Vertical Displacement: -3
Reflection: Yes / No
Count:



Station 3: Writing Equations

WRITE THE EQUATION OF...

1. a cosine function with a period of $\frac{\pi}{6}$ and an amplitude of 2 that has no vertical displacement but has been reflected over the x-axis.

$y = -2 \cos 12\theta$

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

$\frac{\pi}{6} = \frac{2\pi}{b}$ $b = 12$

2. a sine curve with a period of π and an amplitude of 5 that has a phase shift of $\frac{\pi}{6}$ and has been vertically displaced downwards by 3.

$y = 5 \sin 2\left(x - \frac{\pi}{6}\right) - 3$

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

$b = 2$

3. a cos curve with a period of 4π and an amplitude of 1/3 that has been vertically displaced upwards by 2.

$y = \frac{1}{3} \cos \frac{1}{2}\theta + 2$

Station 4: Identifying Transformations

Describe the transformations occurring in each function - state the amplitude and period.

Identify reflections, asymptotes and vertical displacements if any.

Would the problem require a chart or is it quick to count?

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

amp $= \frac{2}{7}$

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

down $\pi \rightarrow (-\pi)$

2. $y = -3\cos\left(\frac{3}{2}x\right)$

amp $= 3$

per $= \frac{4\pi}{3}$

reflection

3. $y = 3 - \frac{3}{4}\sin(4x - 1)$ $+3$ (move)

amp $\frac{3}{4}$

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

phase shift $\frac{1}{4}$ (right+) $\Rightarrow (4x - 1)$

$4\left(x - \frac{1}{4}\right)$

Vertical $+3$

Station Five: Graphing Mix

Graph 2 full periods of each function. Label the scale on both axes and identify key information

1. $y = 2 + 3\cos(2x - 4\pi)$

$2(x - 2\pi)$

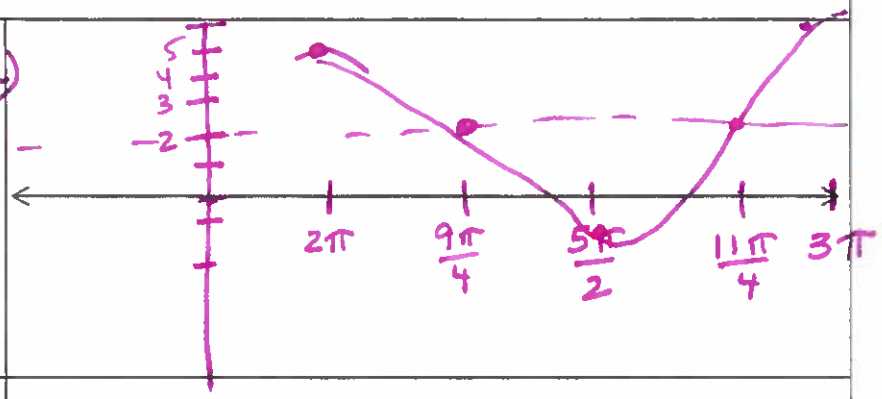
$A = 3$

$per = \pi$

phase shift 2π

count by $\frac{\pi}{4}$

$+2$



2. $y = 2\sin\left(2x - \frac{4\pi}{3}\right) - 1$

$2\left(x - \frac{2\pi}{3}\right)$

$a = 2$

$per = 4$

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

count by $\frac{\pi}{4}$