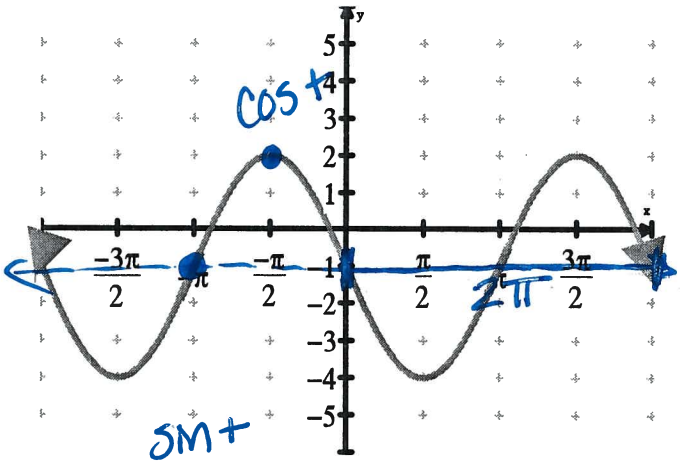
Modeling Trig Functions

DAY 7

1. Write a sine and cosine equation of the function.



Step 1: Draw the middle line.

Step 2: Find a and d.

$a = 3$

$d = -1$

Step 3: Write the period formula. Find the period on the graph. (measure from the y-axis). Solve for b.

Step 4: Choose a starting point (sine is in the middle, cosine is low or high)

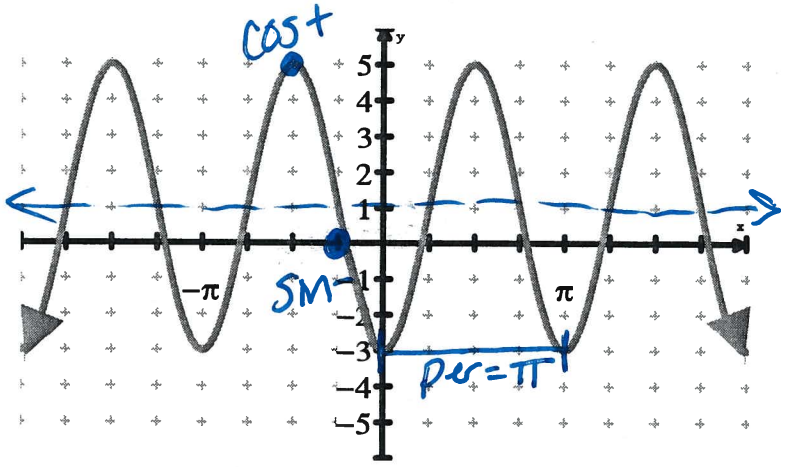
Step 5: Determine if a will be positive or negative based on the starting point.

Step 4: Write (bx – c) = 0 and substitute b. Find the phase shift on the graph and substitute it for x. Then solve for c.

Step 5: Write the function!

Sine	Cosine
$y = a\sin(bx-c)+d$ $y = 3\sin(bx-c)-1$	$y = a\cos(bx-c)+d$ $y = 3\cos(bx-c)-1$
$\frac{2\pi}{b} = 2\pi$ $b = 1$	$\frac{2\pi}{b} = 2\pi$ $b = 1$
$bx-c=0$ $1(-\pi)-c=0$ $-\pi = c$	$bx-c=0$ $1(-\frac{\pi}{2})-c=0$ $-\frac{\pi}{2} = c$
$y = 3\sin(1x+\pi)-1$	$y = 3\cos(1x+\frac{\pi}{2})-1$

2. Write a sine and cosine equation of the function below.

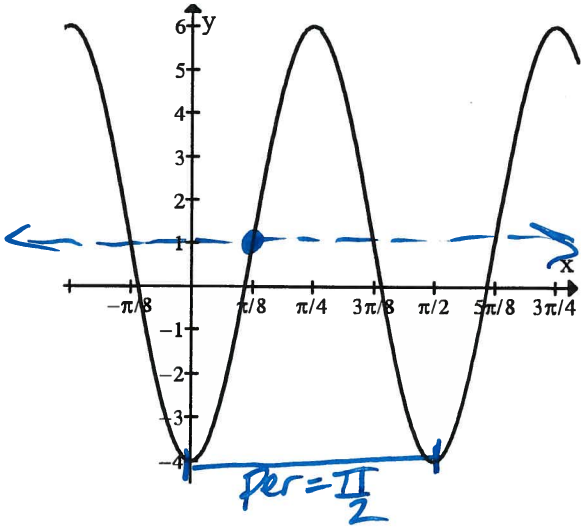


$a = 4$

$d = 1$

Sine	Cosine
$y = 4\sin(bx - c) + 1$	$y = 4\cos(bx - c) + 1$
$\frac{2\pi}{b} = \pi$ $\frac{2\pi}{\pi} = \frac{b\pi}{\pi}$ $b = 2$ $bx - c = 0$ $2(-\frac{\pi}{4}) - c = 0$ $-\frac{\pi}{2} = c$	$b = 2$ $bx - c = 0$ $2(-\frac{\pi}{2}) - c = 0$ $-\pi = c$
$y = -4\sin(2x + \frac{\pi}{2}) + 1$	$y = 4\cos(2x + \pi) + 1$

3. Write a sine equation of the function below.



$a = 5$

$d = 1$

$y = 5\sin(bx - c) + 1$

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

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

$b = 4$

$bx - c = 0$

$4(\frac{\pi}{8}) - c = 0$

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

$y = 5\sin(4x - \frac{\pi}{2}) + 1$