Name: _____ Date: _____

Learning Goal 5.1	Graphing primary trigonometric functions, including transformations and characteristics

Phase Shift - horizontal translation.

$y = \sin(x - c)$ ← to the right by c $y = \cos(x + c)$ ← move to the left by c

Vertical Displacement - vertical translation

$y = \sin x + d$ ← up by d

$y = \sin x - d$ ← down by d.

Example Complete the table for each of the following functions.

Function	Period	Amplitude	Vertical Displacement	Phase Shift	Maximum	Minimum
$y = \sin x + 10$	2π	1	$+10$	—	VD a: $10+1=11$	VD a: $10-1=9$
$y = \sin\left(x - \frac{\pi}{7}\right)$	2π	1	—	$+\frac{\pi}{7}$	1	-1
$y = \sin\left(x + \frac{5\pi}{3}\right) - 2$	2π	1	-2	$-\frac{5\pi}{3}$	$-2+1=-1$	$-2-1=-3$
$y = \cos x - 15$	2π	1	-15	—	$-15+1=-14$	$-15-1=-16$
$y = \cos(x - 3)$	2π	1	—	$+3$	1	-1
$y = \cos\left(x + \frac{\pi}{4}\right) + 4$	2π	1	$+4$	$-\frac{\pi}{4}$	$4+1=5$	$4-1=3$

Example Complete the table below.

Function	Period	Amplitude	Vertical Displacement	Phase Shift	Max.	Min.	Equation
sin	2π	1	3 ↑	2 →	$3+1=4$	$3-1=2$	$y = \sin(x-2)+3$
cos	2π	1	5 ↑	$\frac{\pi}{4}$ ←	6	4	$y = \cos\left(x+\frac{\pi}{4}\right)+5$
sin	2π	2	3.5 ↓	none	$-3.5+2=-1.5$	$-3.5-2=-5.5$	$y = 2\sin x - 3.5$
cos	π	1	none	60° →	1	-1	$y = \cos(2(x-60))$

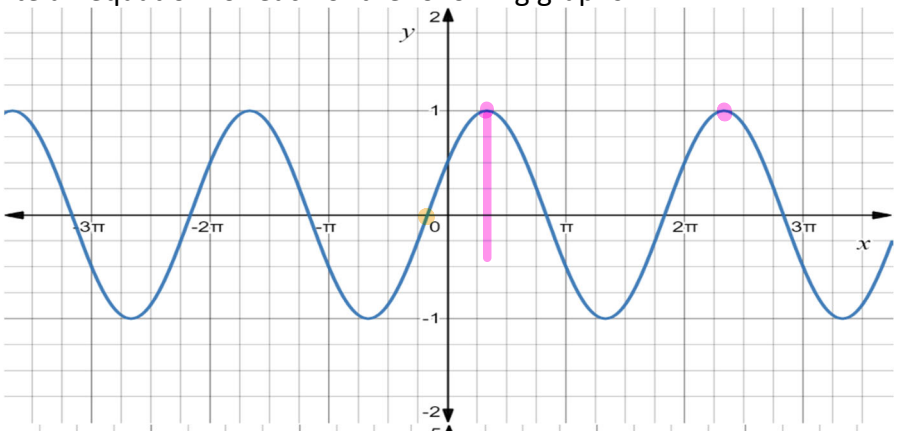
Assignment p. 250 # 1 – 9, 11, 12, 14 – 16, 26, 27, C2 Quiz Next Day!

$2\pi \times \frac{1}{2} = \pi$

$\cos(2x - 60)$

Example Write an equation for each of the following graphs.

a.

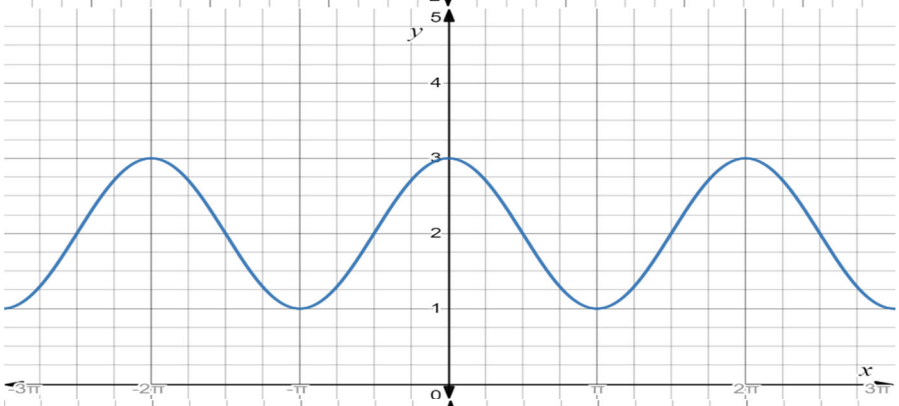


PHASE SHIFT ✓
- NO H.S.
- NO V.D.
- NO V.S

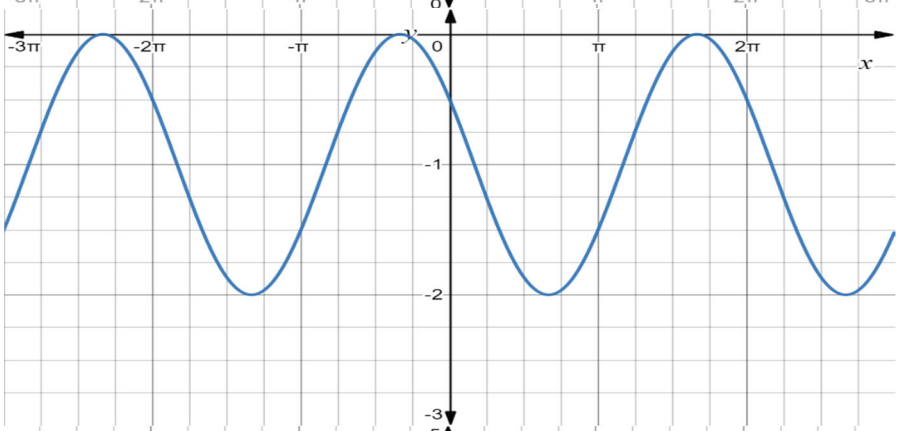
$y = \cos\left(x - \frac{\pi}{3}\right)$

$y = \sin\left(x + \frac{\pi}{8}\right)$

b.



c.



d.