Today's Learning Goal(s):

By the end of the class, I will be able to:

a) sketch a trig functions that has undergone various tranformations.
b) determine **an equation** of a trig function when given the graph.

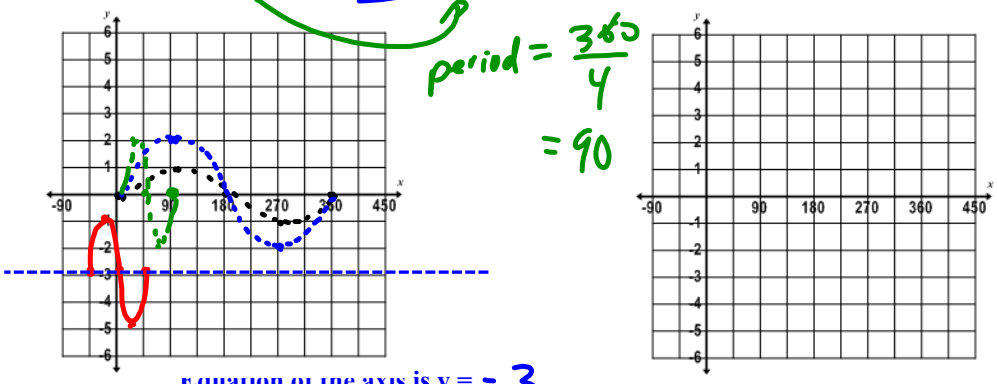
4.7.1 Reviewing Combined Transformations of Trigonometric Functions

$y = a\sin\left(k\left(x-d\right)\right)+c$ and $y = a\cos\left(k\left(x-d\right)\right)+c$ Date: Apr. 17/18

Ex.1 Sketch $y = 2\sin\left(4\left(x+45°\right)\right)-3$ by hand.

Method: 1. sketch the base function [$y = \sin x$ or $y = \cos x$]
2. apply any compressions and stretches and then sketch again.
[use the key points: 0°, 90°, 180°, 270°, 360°]
3. apply any translations and sketch the final curve

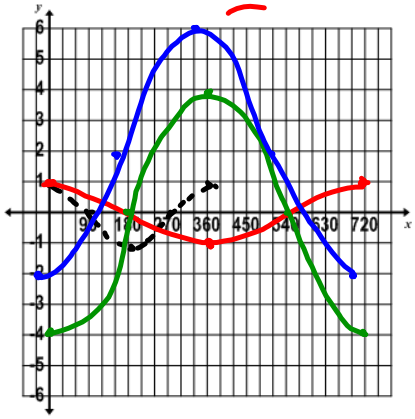
$y = \sin(x)$ $y = \sin(4x)$, and $y = 2\sin(4x)$ $y = 2\sin(4(x+45°)) - 3$

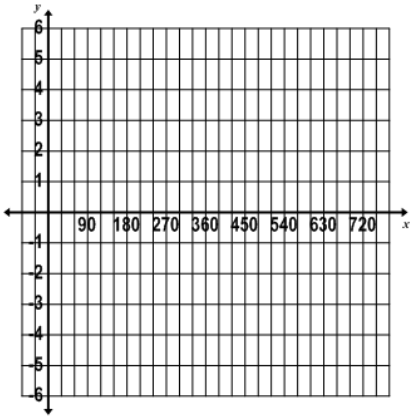


Equation of the axis is y = -3

Key Properties:
Amplitude 2
Period 90°
Phase Shift 45° to the left
Domain $\{x \in \mathbb{R}\}$ Range $\{y \in \mathbb{R} \mid -5 \le y \le -1\}$

Ex.2 Sketch $y = -4\cos\left(\frac{1}{2}(x+30°)\right)+2$ by hand.





period = $\frac{360°}{b}$

$= \frac{360°}{\frac{1}{2}}$

$= 720°$

Key Properties:

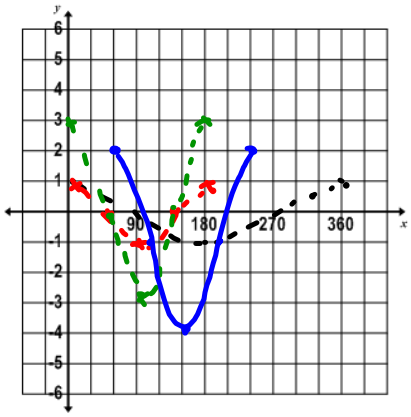
Amplitude 4

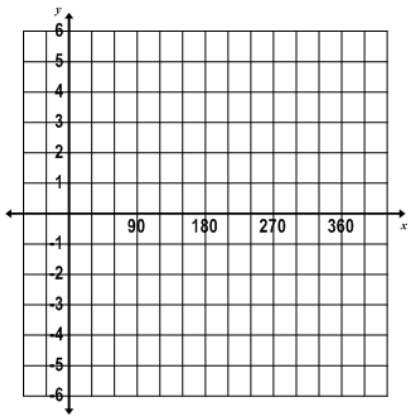
Period 720°

Phase Shift 30° to the left

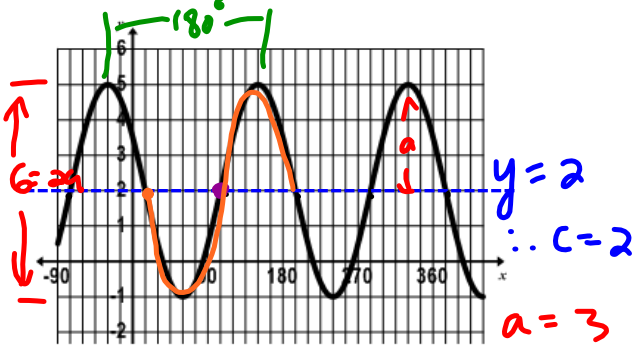
Domain $\{x \in \mathbb{R}\}$ Range $\{y \in \mathbb{R} \mid -2 \le y \le 6\}$

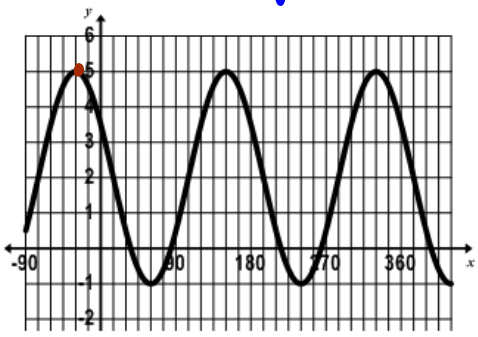
Ex.3 Sketch $y = 3\cos(2(x-60°))-1$ by hand.





Ex.4 Write 2 different equations to represent this function. $y = a\sin(k(x-d))+c$





$y = 3\sin(2(x+75^\circ))+2$

$y = 3\sin(2(x-105^\circ)+2$

$= -3\sin(2(x-15^\circ)+2$

$y = 3\cos(2(x+30^\circ))+2$

$k = \frac{360^\circ}{\text{period}}$

$= \frac{360^\circ}{180^\circ}$

$= 2$