Learning Outcomes: What should you be able to after watching the videos?

- Video 1: Graphing Using Key Values
  - State and explain the process for graphing sine and cosine functions using key values.
- Video 2: Examples Using Key Values
  - Properly execute the process for graphing sine and cosine functions using key values.
- Video 3: Transformations of Graphs
  - Identify the features of equations that can be used to determine the transformations of graphs.
  - Apply transformations to functions described by charts of values.

#1) Complete the chart of key values for both the sine and cosine functions, and use that information to sketch the graph of the functions. Be sure to clearly indicate the x and y-coordinates.

Key Values	1	2	3	4	5
x					
$\sin(x)$					
Location					

Key Values	1	2	3	4	5
x					
$\cos(x)$					
Location					

#2) For each of the four steps of graphing a sine or cosine function using key values, write a short explanation of what is required to execute the step properly.

1. Identify the fundamental period.

2. Identify the x-coordinates of the key values.

3. Transform the y-coordinates of the key values.

4. Plot the points and sketch the graph.

#3) Graph $y = 3\cos\left(x - \frac{\pi}{4}\right) - 1$.

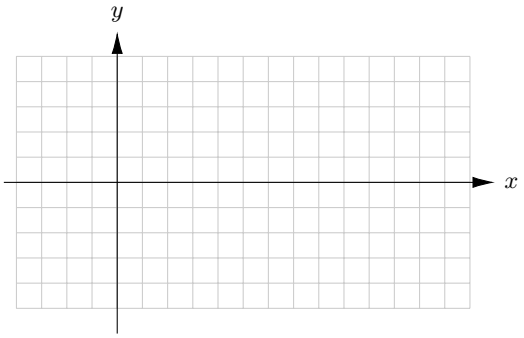
Step 1: Identify the fundamental period

Step 3: Transform the y-coordinates of the key values.

Key Values	1	2	3	4	5
x					
y					

Step 2: Identify the x-coordinates of the key values.

Step 4: Plot the points and sketch the graph.



#4) Graph $y = -2\sin\left(2x + \frac{\pi}{2}\right) + 2$.

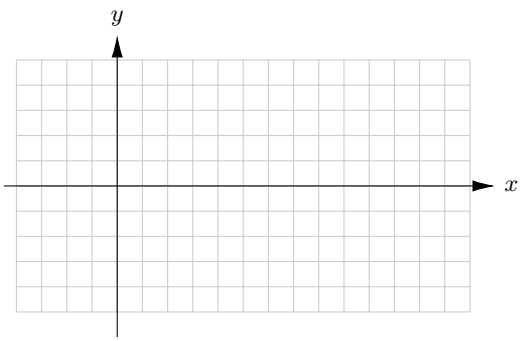
Step 1: Identify the fundamental period

Step 3: Transform the y-coordinates of the key values.

Key Values	1	2	3	4	5
x					
y					

Step 2: Identify the x-coordinates of the key values.

Step 4: Plot the points and sketch the graph.



#5) Use the chart of values to evaluate the given functions at the indicated points. Then describe the transformation relative to the function $f(x)$.

x	-3	-2.5	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2	2.5	3
$f(x)$	1	0.5	0	-0.5	-1	-0.5	0	0.5	1	0.5	0	-0.5	-1

x	-2	-1	0	1	2
$f(x)$					
$f(x+1)$					
Description:					

x	-2	-1	0	1	2
$f(x)$					
$f(x-1)$					
Description:					

x	-2	-1	0	1	2
$f(x)$					
$f(x)+1$					
Description:					

x	-2	-1	0	1	2
$f(x)$					
$f(x)-1$					
Description:					

x	-2	-1	0	1	2
$f(x)$					
$-f(x)$					
Description:					

x	-2	-1	0	1	2
$f(x)$					
$2f(x)$					
Description:					

x	-2	-1	0	1	2
$f(x)$					
$f\left(\frac{x}{2}\right)$					
Description:					

x	-1	-0.5	0	0.5	1
$f(x)$					
$f(2x)$					
Description:					

#6) Describe the features of each transformation, or state N/A if there is no transformation of that type.

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

Horizontal shift:

Horizontal stretch/compression/flip:

Vertical stretch/compression/flip:

Vertical shift:

$y = -2\sin(2x - \pi) + 2$

Horizontal shift:

Horizontal stretch/compression/flip:

Vertical stretch/compression/flip:

Vertical shift:

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

Horizontal shift:

Horizontal stretch/compression/flip:

Vertical stretch/compression/flip:

Vertical shift:

$y = -\cos(\pi x - \frac{3\pi}{4}) + 1$

Horizontal shift:

Horizontal stretch/compression/flip:

Vertical stretch/compression/flip:

Vertical shift:

Was any aspect of any of the videos confusing or unclear? Do you have any questions?