Honors Advanced Algebra
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DATE: \_\_\_\_\_

# 8.4 & 8.5 Graphs of Sinusoidal Functions (Target 6B)

# Review of Prior Concepts

- From the parent function f(x) = x<sup>2</sup>, describe the transformation of g(x) = (x - 1)<sup>2</sup> + 3 and give the domain and range of g(x).
- 2) From the parent function h(x) = e<sup>x</sup>, describe the transformation of k(x) = e<sup>x+1</sup> 3 and give the domain and range of k(x).

## Vocabulary

- Sinusoidal Functions –
- Amplitude –
- Period –
- Phase Shift –
- Vertical Shift –

 $y = a \sin(bx + c) + d$  OR  $y = a \cos(bx + c) + d$ 

Open the TI-Nspire document: Basic\_Transformations.tns

## Move to page 1.2

**1.** Drag the sliders to change the values of *a* in the function  $f(x) = a \sin(bx)$ .

- a) How does the value of *a* affect the shape of the graph?
- b) What happens to the graph if *a* is negative?
- c) How does the value of *b* affect the shape of the graph?

## Conclusion:

For  $a \neq 0$  and b > 0, the graph of  $f(x) = a \sin(bx)$  has an amplitude of \_\_\_\_\_ and a period of \_\_\_\_\_.

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**2.** Drag the sliders to change the value of *d* in the function of f(x) = sin(x) + d.

How does the value of *d* affect the shape of the graph?

## Conclusion:

The graph of  $f(x) = \sin(x) + d$  has a vertical shift of \_\_\_\_\_.

### Move to page 3.2

3. Drag the sliders to change the value of c in the function of f(x) = sin(x + c). How does the value of c affect the shape of the graph?

Conclusion:

The graph of  $f(x) = \sin(x + c)$  has a phase shift of \_\_\_\_\_.

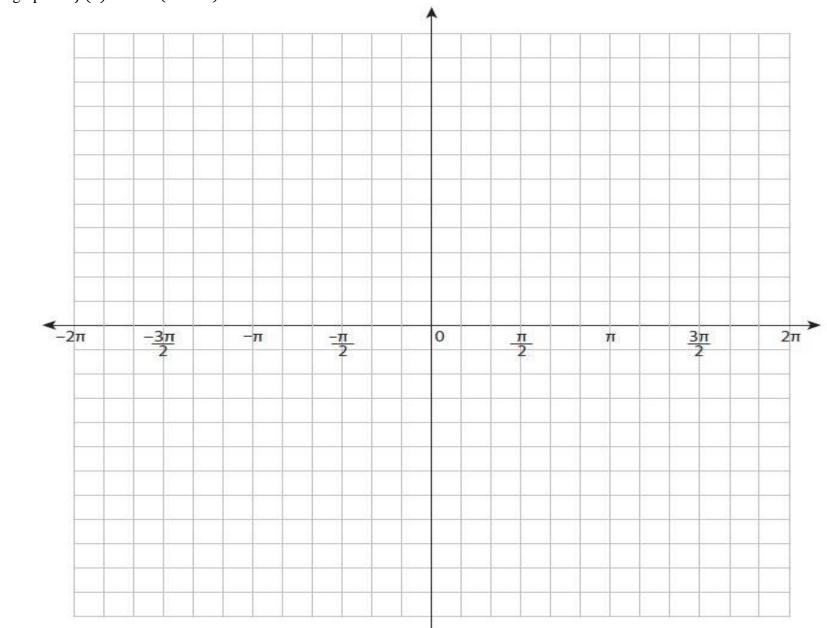
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4. Drag the sliders to change the value of *a*, *b*, *c* and *d* in the function  $f(x) = a \sin(bx + c) + d$ . Which of the four parameters have an impact on the phase shift of the graph?

## Conclusion:

The graph of  $f(x) = a \sin(bx + c) + d$  has a phase shift of \_\_\_\_\_.

Transformation	General Form $f(x) = a \sin(bx + c) + d$ OR $f(x) = a \cos(bx + c) + d$	<b>Example</b> $f(x) = 3\sin(2x + \pi) - 4$
Amplitude		
Period		
Phase Shift		
Vertical Shift		



Sketch the graph of:  $f(x) = 3\sin(2x + \pi) - 4$