

8.4 & 8.5 Graphs of Sinusoidal Functions (Target 6B)*Review of Prior Concepts*

1) From the parent function $f(x) = x^2$, describe the transformation of $g(x) = (x - 1)^2 + 3$ and give the domain and range of $g(x)$.

2) From the parent function $h(x) = e^x$, describe the transformation of $k(x) = e^{x+1} - 3$ and give the domain and range of $k(x)$.

Vocabulary

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

$$y = a \sin(bx + c) + d \quad \text{OR} \quad y = a \cos(bx + c) + d$$

Open the TI-Nspire document: *Basic_Transformations.tns*

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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 _____.

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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 $f(x) = a \cos(bx + c) + d$	Example $f(x) = 3 \sin(2x + \pi) - 4$
Amplitude		
Period		
Phase Shift		
Vertical Shift		

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

