Trigonometry Engaging Resources

T SO4: Desmos Sinusoidal Transformations Investigation

(Download: SineTransformationsInv.docx)

This investigation assumes that students understand the basic properties of y = sinx and y = cosx and the transformations related to y = a f[b(x - c)] + d. Students will explore how the parameters a, b, c, and d affect sinusoidal functions.

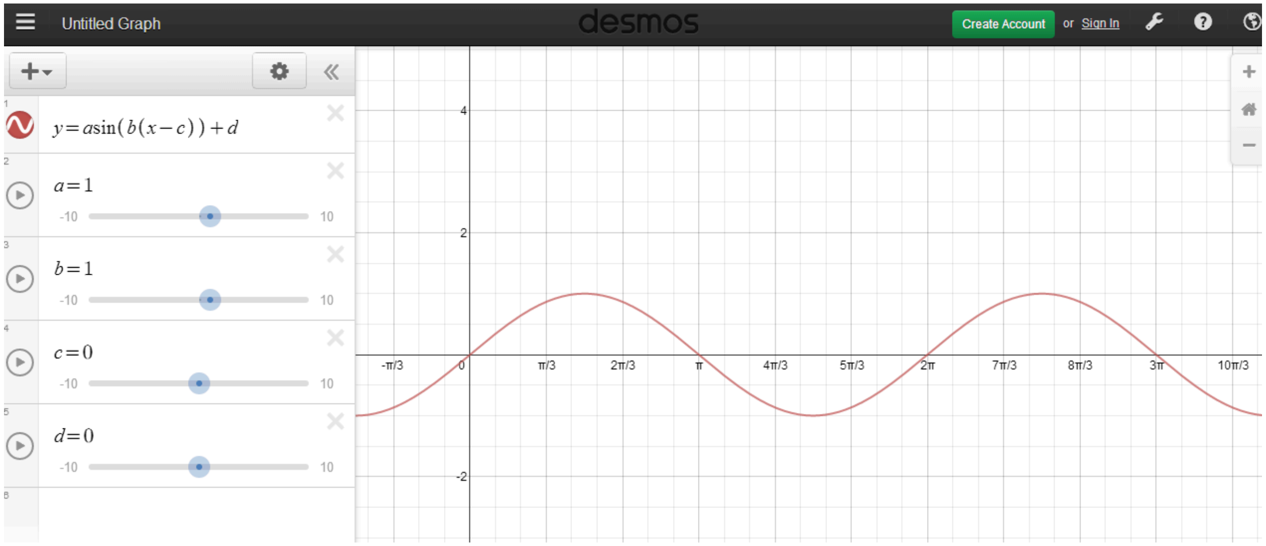
The investigation involves three steps:

1. **Use Visualization to predict what characteristics will change when each of the parameters are adjusted.**

Characteristics

Parameters	amplitude	period	midline	x-intercepts	y-intercept	domain	range
a							
b							
c							
d							

2. Verify the predictions from step 1 by using Desmos and sliders for each parameter.



3. Explore in more detail the relationship between the parameters and the characteristics of the graph.

Step 3: Explore Parameters

Use Desmos to explore in more detail the relationship between the parameters and the characteristics of the graph.

Explore *a*: Begin with $y = \sin(x)$ (a = 1, b = 1, c = 0 and d = 0)

- When a = 1, the amplitude of the graph is _________. Note: amplitude = (max – min) / 2
- When a = 2, the amplitude of the graph is _________.
- When a = 4, the amplitude of the graph is _________.
- When a = 0.5, the amplitude of the graph is ________.
- When a = -3, the amplitude of the graph is ________.

Conclusion:

Explore *d*: Begin with $y = \sin(x)$ (a = 1, b = 1, c = 0 and d = 0)

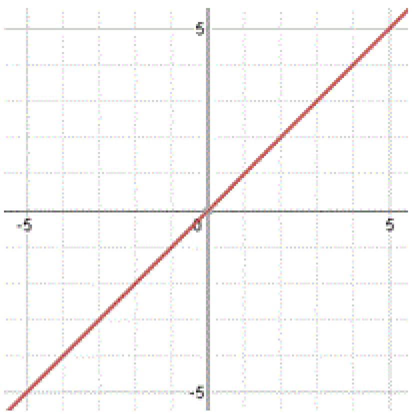
- When d = 0, the midline of the graph is ________. Note: midline = (max + min) / 2
- When d = 2, the midline of the graph is ________.
- When d = -4, the midline of the graph is

T SO4: Investigation - Transformations Connections

(Download: TransformationsConnections.docx)

This activity asks students to review a transformation on a function they are already familiar with and then apply the same type of transformation to a sinusoidal function.

1. Linear function, $f(x)=x$ becomes $y=2x$



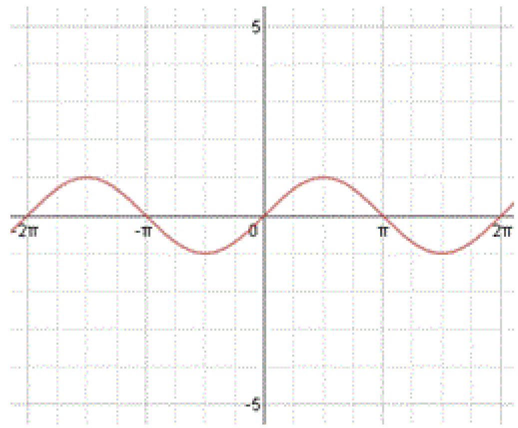
mapping notation

$(x,y)\rightarrow$

equation in $y=af\left[b(x-c)\right]+d$

describe the transformation.

2. Sinusoidal function, $f(x)=\sin x$ becomes $y=2\sin x$



mapping notation

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equation in $y=af\left[b(x-c)\right]+d$

describe the transformation.