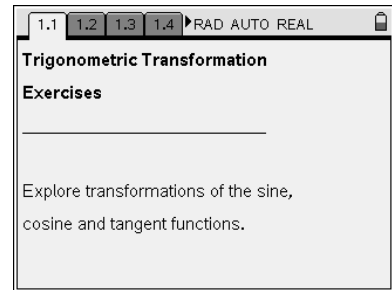




This activity explores transformations of the trigonometric functions sine, cosine, and tangent. The transformations include amplitude changes, period changes, vertical shift, and horizontal shift.



- Open the TI-Nspire document *Trigonometric\_Transformation\_Exercises*.
- Press   to move to page 1.2 and begin the activity.
- Move to page 1.3.

1. Looking at the graph of  $\sin(x)$ , what are the amplitude and period? Explain how you can tell by looking at the graph.

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2. Change the function to graph  $\cos(x)$ . What are the amplitude and period of this graph? Explain.

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3. Now change the function to graph  $\tan(x)$ . What are the amplitude and period? Explain.

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- Move to page 1.7.

On page 1.8, the graph of  $\sin(x)$  is represented by the dashed curve, and a transformation of  $\sin(x)$  is represented by the solid curve.

4. How has the  $\sin(x)$  graph changed? Write an equation in the form of  $f(x) = \sin(Bx)$  to represent the transformed graph. To check your equation, graph it on the same page.

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➤ **Move to page 1.10.**

On page 1.11, the graph of  $\cos(x)$  is represented by the dashed curve, and a transformation of  $\cos(x)$  is represented by the solid curve.

5. How has the  $\cos(x)$  graph changed? Write an equation in the form of  $f(x) = A\cos(x)$  to represent the transformed graph. To check your equation, graph it on the same page.

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➤ **Move to page 1.14.**

6. Write an equation in the form of  $f(x) = A\cos(Bx)$  to represent the graph shown. To check your equation, graph it on the same page.

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Along with amplitude and period changes, a trigonometric graph can also be shifted horizontally and vertically. Using the equation  $f(x) = A\cos(Bx + C) + D$  as an example,  $C$  represents horizontal shift and  $D$  represents vertical shift.

7. Now, how can you represent the graph on page 1.14 using the sine function? Write an equation in the form of  $f(x) = A\sin(Bx + C)$  to represent the graph. To check your equation, graph it on the same page.

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