

Investigating Trigonometric Functions

Name _____

The Inverse Functions [TrigFunc.gsp]

I. Click on the section titled “**Sine Inverse Function**” (or click the tab at the bottom of the screen. Answer the following questions:

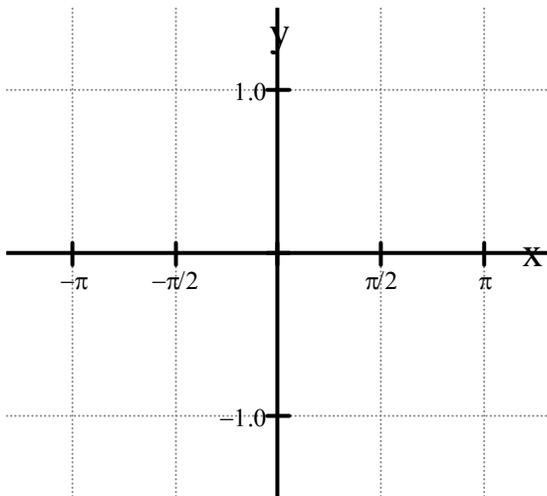
1. Click on “**Show $y = x$ for reflection**”. Why are we interested in examining the line $y = x$ when dealing with inverses? _____

2. Click on “**Show Sine Inverse**”. Is the new inverse graph a function? _____ How did you make your decision? _____
3. Drag point X . Watch points A and B . What do you notice about points A and B ? _____

Using your knowledge of inverses, explain why this is happening? _____

4. Click on “**Hide Sine Inverse**”. Click on “**Show Sine Inverse Function**”.
5. This new graph is only a “portion” of the previous inverse graph. Why is the sine inverse function graph only a “portion” of the sine inverse graph? _____

6. What is the domain of this restricted graph? _____
Over what domain of the original function was this inverse formed? _____
7. What is the range of this restricted graph? _____
8. The notation used in Sketchpad for sine inverse is $\sin^{-1}(x)$. What other notation can also be used to represent sine inverse? _____



9. Using the grid at the left, graph the sine inverse function.

Be careful that your x -values in full decimal form from Sketchpad and the x -values in radian notation on the graph grid represent the same values.

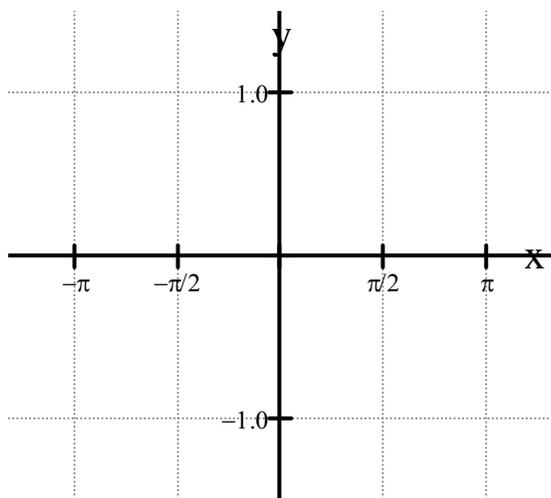
10. Explain why the domain of this inverse function graph was chosen as you see it in Sketchpad? _____

II. Click on the section titled “**Cosine Inverse Function**” (or click the tab at the bottom of the screen. Answer the following questions:

1. Click on “**Show $y = x$ for reflection**”. What function name is given to the line $y = x$?

- Click on “**Show Cosine Inverse**”. Is the new inverse graph a function? _____ What is the name of the test used to determine if the inverse of a function is itself a function? _____
- Drag point X . Watch points A and B . Are the x and y values switching places? _____
- Click on “**Hide Cosine Inverse**”. Click on “**Show Cosine Inverse Function**”. Again, the inverse function graph is only a “portion” of the full inverse graph.
- What is the domain of this restricted graph? _____
Over what domain of the original function was this inverse formed? _____
- What is the range of this restricted graph? _____
- Explain why the domains of the original functions over which the sine inverse function and the cosine inverse functions were formed are different. _____

- The notation used in Sketchpad for cosine inverse is $\cos^{-1}(x)$. What other notation can also be used to represent cosine inverse? _____

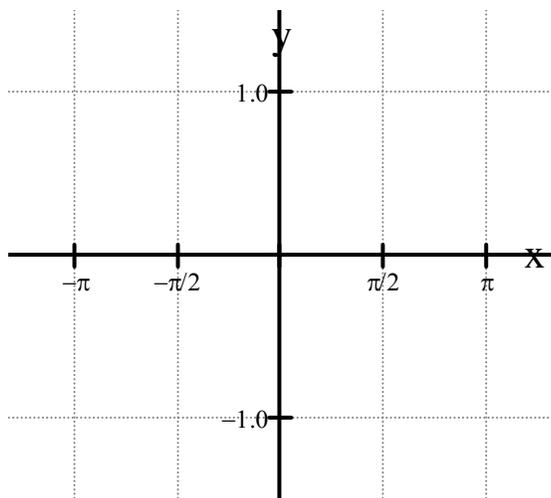


- Using the grid at the left, graph the cosine inverse function.

Be careful that your x -values in full decimal form from Sketchpad and the x -values in radian notation on the graph grid represent the same values.

III. Click on the section titled “**Tangent Inverse Function**” (or click the tab at the bottom of the screen. Answer the following questions:

- Click on “**Show $y = x$ for reflection**”. Click on “**Show Tangent Inverse**”.



- Is the new inverse graph a function? _____
- Click on “**Hide Tangent Inverse**”. Click on “**Show Tangent Inverse Function**”.
- What is the domain of this restricted graph? _____
Over what domain of the original function was this inverse formed? _____
- What is the range of this restricted graph? _____

- Using the grid at the left, graph the tangent inverse function.