



# What Is Your Identity?

Functions  
Cosine  
Sine  
Identities

## Deleting an Equation in the GRAPH Menu

Highlight the equation  
Press F2 (DEL)  
F1 (YES)

## Changing from Degrees to Radians

Press Shift key  
Menu key  
Down Arrow to Angle  
F2 (Rad)  
Exit key

## Resizing the Graph Window

Press Shift key  
F3 (V-WIN)  
Highlight Xmin, Xmax, Ymin, or Ymax.  
Enter desired value  
EXE key  
Repeat steps to alter min or max values for X or Y.

## Changing the Color of an Equation and Graph in the GRAPH Menu

Highlight the equation.  
Press F4 (COLR)  
Select desired color:  
F1 (Blue),  
F2 (Orng), or  
F3 (Grn)  
Exit key

**Standards:** Problem Solving, Communication, Reasoning, Algebra, Functions, and Trigonometry.

**Materials:** CFX-9850G or CFX-9850Ga PLUS

**Calculator Menus:** RUN and GRAPH

Recall the graph of the  $Y = \sin X$  and  $Y = \cos X$  functions as shown in Figure 1 and Figure 2 respectively. You may need to change the calculator from degrees to radians.

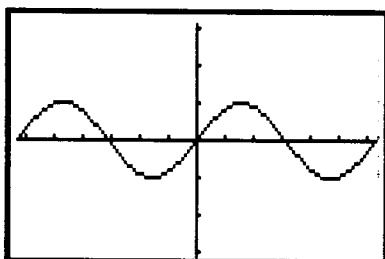


Figure 1

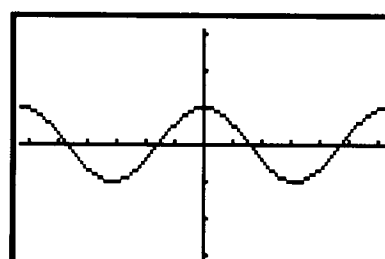


Figure 2

Describe and sketch the graphs of  $Y = A\sin(BX + C)$  and  $Y = D\cos(EX + F)$  when  $A = B = C = D = E = F = 1$ . **A.**

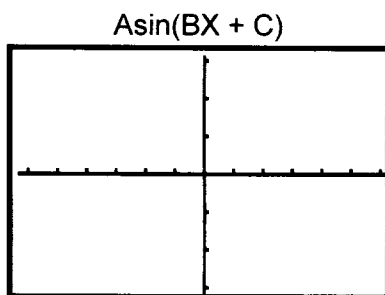


Figure 3

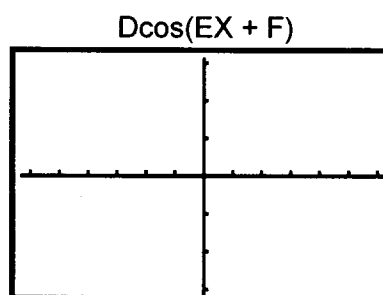


Figure 4

Set the limits of the graph window so the X values go from  $-3\pi$  to  $+3\pi$  and the Y values go from  $-1$  to  $+1$  and graph  $Y = \sin(X + 1)$  in blue and  $Y = \cos(X + 1)$  in orange.

Describe the graphs  $Y = (\sin X)^2$  and  $Y = (\cos X)^2$ . **B.**

Graph  $Y = (\sin X)^2$  in blue and  $Y = (\cos X)^2$  in orange.

## What Is Your Identity?

### De-selecting an Equation in the GRAPH Menu

Highlight the equation  
Press F1 (SEL)  
The = sign will turn blue  
when de-selected.

? represents a high level question

**Historical note:** Until a few hundred years ago, a picture was accepted as a proof. Only has the world of mathematics has become more formalized has it become desired to have a proof that goes beyond pictures.

Does your description reflect what happened in the graph window for  $Y = (\sin X)^2$  and  $Y = (\cos X)^2$ ? Explain why or why not **C**.

? Predict what the graph of  $Y = (\sin X)^2 + (\cos X)^2$  will look like. **D**.

Graph  $Y = (\sin X)^2 + (\cos X)^2$  in blue. Is this what you expected? Explain your reasoning. **E**.

Graph  $Y = 1$  on the calculator in orange.

? After seeing the graph of  $Y = (\sin X)^2 + (\cos X)^2$  and  $Y = 1$ , what can you conclude? **F**.

You have established graphically that  $(\sin X)^2 + (\cos X)^2$  (more commonly written as  $\sin^2 X + \cos^2 X$ ) = 1. Explain why this is not an acceptable method of proving this identity. **G**.

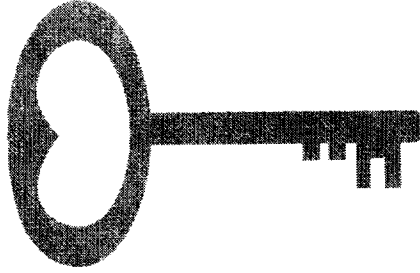
Explain the advantages of using a graph as a means of establishing the basis of a proof. **H**.

Graph  $Y = (\sin X) \div (\cos X)$  on the calculator in blue. Does this look familiar? Explain your reasoning. **I**.

Graph  $Y = \tan X$  on the calculator in orange. What do you conclude about the two graphs? **J**.

Give an identity and use the graphing calculator to pictorially prove the identity. **K**.

# Solution Key



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## What Is Your Identity?

**A. - F.** Answers will vary.  
**H. - I.** Answers will vary.

**G.** A picture is not an acceptable proof.  
**J.** They are the same      **K.** Answer will vary