Chapter 11 / **Example 15**

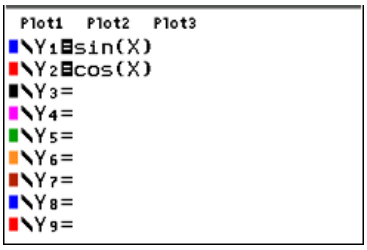
Area between curves

Find the area of the region bounded by $y = \sin x$, $y = \cos x$, $x = 0$ and $x = 2\pi$.

Press [F1] [Y=] to display the equation entry screen.

Type $\sin(x)$ and press [ENTER] to enter the first equation as Y_1.

Type $\cos(x)$ and press [ENTER] to enter the second equation as Y_2.

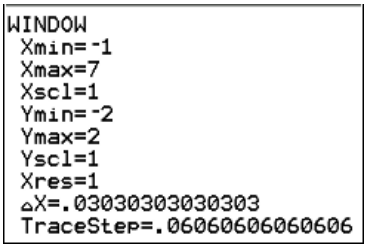


Press [F2] [WINDOW]

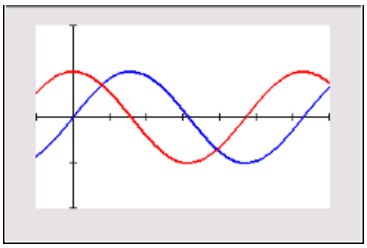
Set the axes to show $-1 \leq x \leq 7$ and $-2 \leq y \leq 2$.

You can leave the last three items as they are.

Press [F5] [GRAPH] when you have finished.



The GDC now displays the curves $Y_1 = \sin x$ and $Y_2 = \cos x$.

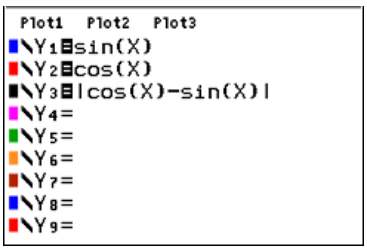


Since the curves are alternately above and below each other use the modulus function to find the area between them.

Press [F1] [Y=] to display the equation entry screen.

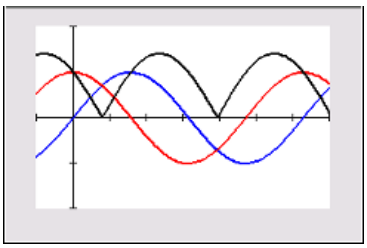
Type ▯ [F2] 1:abs(

Then type $\cos(x) - \sin(x)$ and press [ENTER] to enter the modulus function as Y_3.



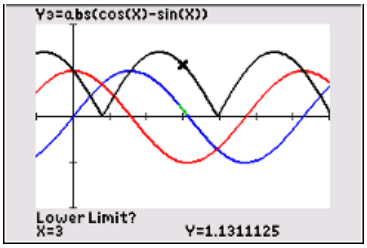
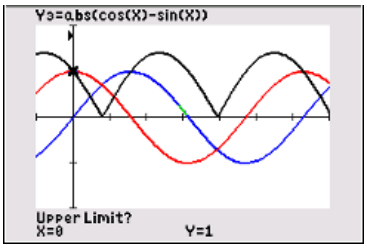
Press [F5] [GRAPH].

The area between the curves Y_1 and Y_2 is equivalent to the area between the curve Y_3 and the x-axis.



Chapter 11 / **Example 15**

Area between curves

Press [2nd] [CALC] 7:∫f(x)dx Press ▲ to select Y_3 To find the area you need to give the lower and upper limits of the region that includes the intersection. The GDC asks you to set the lower limit.	
Type 0 and press [ENTER]. The GDC asks you to set the upper limit.	
Type 2 ´ π and press [ENTER]. The area under the line Y_3 is 5.66.