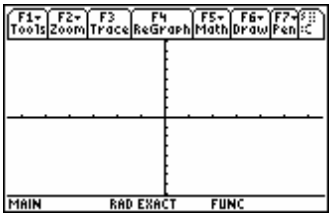
Assignment 4: Trigonometry and Exponentials (0.4&5) Name_____
Please provide a handwritten response.

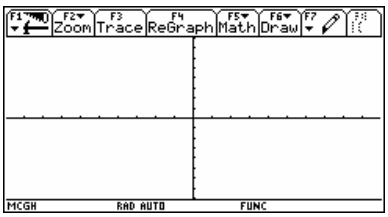
1a. To graph trigonometric functions you want your calculator settings to be in **radians** and use the **zoom trig** option.

PROBLEM	TI-89	Voyage 200
Graph $y = \sin x$	Set calculator in radians (**MODE**) Set graphing window to **ZOOM 7 ZTrig .** The default window is $-3.292\pi \le x \le 3.292\pi, -4 \le y \le 4$ From ♦ **Y =** enter $y_1 = \sin(x)$ and ♦**GRAPH**	Set calculator in radians (**MODE**) Set graphing window to **ZOOM 7 ZTRIG.** The default window is $-4.958\pi \le x \le 4.958\pi, -4 \le y \le 4$ From ♦ **Y =** enter $y_1 = \sin x$ and ♦**GRAPH**

Sketch your graph on the appropriate set of axes below.



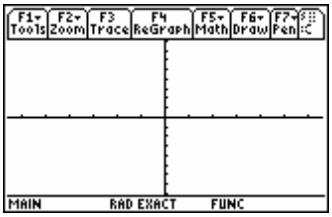
TI-89



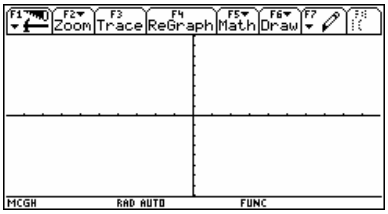
Voyage 200

1b. More complicated trigonometric functions can be used but are not always written for the calculator as they would be in traditional mathematical notation. For example, graph the function $y = \sin^2 x$ on the axes below.

PROBLEM	Voyage 200
Graph $y = \sin^2 x$	$y_1 = (\sin x)\wedge 2$ Watch the exponent.

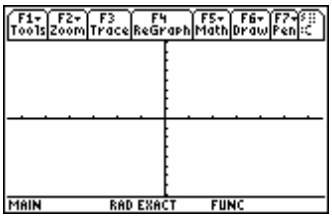


TI-89

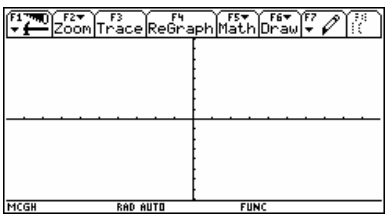


Voyage 200

1c. The cosine function is represented on the calculator by $y = \cos x$ and the tangent function by $y = \tan x$. Sketch the graph of $y = \cos(5x) + \sin(5x)$ below.



TI-89



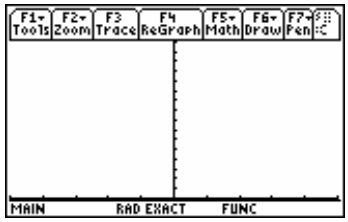
Voyage 200

2. You can convert between degrees and radians on the calculator as you do by hand. To **convert from degrees to radians** (calculator mode set in degrees) multiply by $\frac{\pi}{180°}$. You can find the fractional equivalent by dividing the result by π. You can **convert from radians to degrees** (calculator mode set in radians) by multiplying by $\frac{180°}{\pi}$.

Convert $60°$ to radians. Convert $\frac{4\pi}{3}$ to degrees. Record both results below. You normally leave the calculator set in radians.

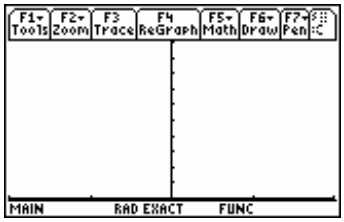
3a. Exponential functions are expressed on the TI-89 and Voyage 200 calculators using the ^ symbol just like any other exponent. For example you can graph $y = 2^x$ by entering $y = 2 \wedge x$ into the calculator. Graph this function and record your result below.

3b. The constant $e = 2.71828...$ is found on the keyboard as $e^{\wedge}$. It is located above the **LN** key and is accessed by **2ND LN** on the Voyage 200**.** It is above the x on the TI-89 and accessed by $\blacklozenge x$**.** Graph the function $f(x) = 10e^x$ by entering $y = 10e \wedge x$ and record the result below.



$-5 \le x \le 5, 0 \le y \le 32$

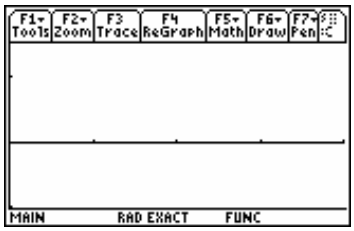
$y = 2^x$



$-2 \le x \le 2, 0 \le y \le 20$

$y = 10e^x$

4. On your calculator the natural logarithm function $\ln x$ is represented by LN and the common logarithm $\log_{10} x$ is represented by $\log($ which you can access through the catalog. The logarithm of x with base b, $\log_b x$ can be entered using the change of base formula $\log_b x = \frac{\ln x}{\ln b}$. Now graph $y = \log_{1/2} x$ and $y = \ln x$ on the same axes and sketch the result below. Label which graph is which.



$0 \le x \le 4, -2 \le y \le 3$