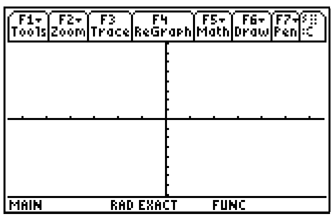
Assignment 4: Trigonometry and Exponentials (0.5&6)   Name____________________
Please provide a handwritten response.

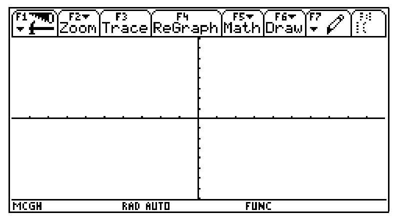
1a. To graph trigonometric functions you want your calculator settings to be in **radians** and use the **zoom trig** option.

PROBLEM	TI-89	TI-92, TI-92 Plus
Graph $y = \sin x$	Set calculator in radians (**MODE**) Set graphing window to **ZOOM 7 ZTrig .** The default window is $\mathbf{-3.292\pi \le x \le 3.292\pi,\ -4 \le y \le 4}$ 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 $\mathbf{-4.958\pi \le x \le 4.958\pi,\ -4 \le y \le 4}$ From ♦ **Y =** enter $y_1 = \sin x$ and ♦**GRAPH**

Sketch your graph on the appropriate set of axes below.



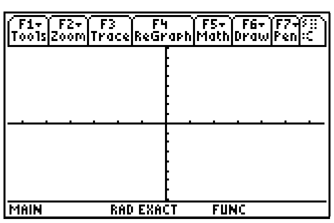
TI-89



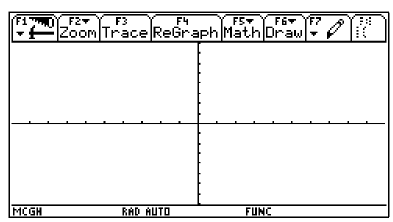
TI-92, TI-92 Plus

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	TI-89, TI-92, TI-92 Plus
Graph $y = \sin^2 x$	$y_1 = (\sin x)\hat{}\,2$ Watch the exponent.

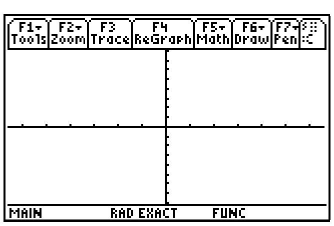


TI-89

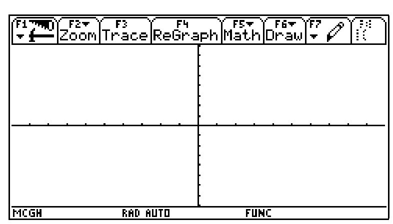


TI-92, TI-92 Plus

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

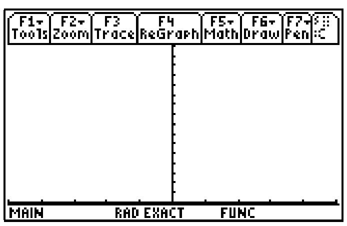


TI-92, TI-92 Plus

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 $\frac{\boldsymbol{\pi}}{\mathbf{180°}}$. You can find the fractional equivalent by dividing the result by $\boldsymbol{\pi}$. You can **convert from radians to degrees** (calculator mode set in radians) by multiplying by $\frac{\mathbf{180°}}{\boldsymbol{\pi}}$. Convert $\mathbf{60°}$ to radians. Convert $\frac{\mathbf{4}\boldsymbol{\pi}}{\mathbf{3}}$ to degrees. Record both results below. You normally leave the calculator set in radians.

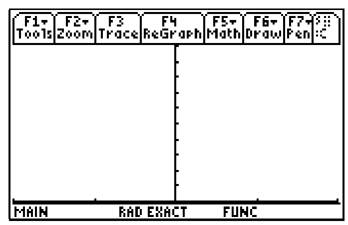
3a. Exponential functions are expressed on the TI-89, TI-92 and TI-92 Plus calculators using the ^ symbol just like any other exponent. For example you can graph $\boldsymbol{y = 2^x}$ by entering $\boldsymbol{y = 2 \wedge x}$ into the calculator. Graph this function and record your result below.

3b. The constant $\boldsymbol{e = 2.71828...}$ is found on the keyboard as $\boldsymbol{e \wedge}$. It is located above the **LN** key and is accessed by **2ND LN** on the TI-92 and TI-92 Plus**.** It is above the ***x*** on the TI-89 and accessed by ♦***x*.** Graph the function $\boldsymbol{f(x) = 10e^x}$ by entering $\boldsymbol{y = 10e \wedge x}$ and record the result below.



$\boldsymbol{-5 \le x \le 5, 0 \le y \le 32}$

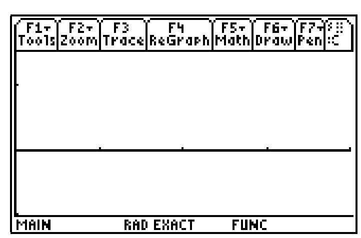
$\boldsymbol{y = 2^x}$



$\boldsymbol{-2 \le x \le 2, 0 \le y \le 20}$

$\boldsymbol{y = 10e^x}$

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



$\boldsymbol{0 \le x \le 4, -2 \le y \le 3}$