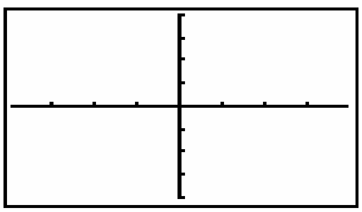
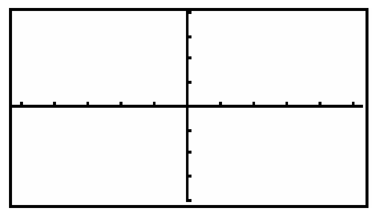
Assignment 4: Trigonometry and Exponentials (0.4&5)Name____________________
Please provide a handwritten response.

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

PROBLEM	TI-83 Plus/TI-84 Plus	TI-86
Graph $y = \sin x$	Set calculator in radians (**MODE**) Set graphing window to **ZOOM 7 ZTrig .** The default window is $\mathbf{-1.958\pi \le x \le 1.958\pi,\ -4 \le y \le 4}$ From the $y=$ key enter $Y_1 = \sin(x)$ and **GRAPH**	Set calculator in radians (**MODE**) Set graphing window to **ZOOM ZTRIG.** The default window is $\mathbf{-2.625\pi \le x \le 2.625\pi,\ -4 \le y \le 4}$ From **GRAPH** $y(x)=$ enter $y_1 = \sin x$ and **2ND GRAPH (F5)**

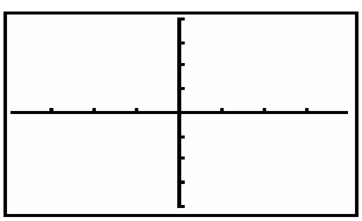
Sketch your graph on the appropriate set of axes below.

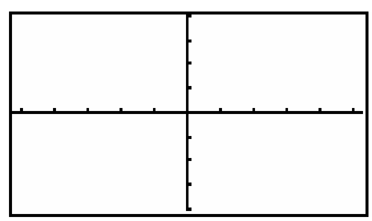

TI-83 Plus/TI-84 Plus


TI-86

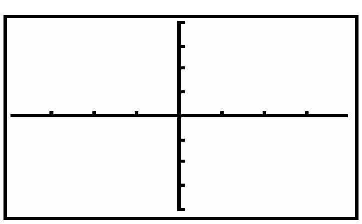
1b. More complicated trigonometric functions can be used but are not always written for the calculator as they would be in traditional mathematical notation. For example, graph the function $y = \sin^2 x$ on the axes below.

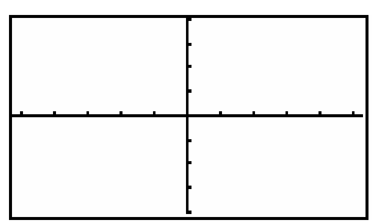
PROBLEM	TI-83 Plus/TI-84 Plus	TI-86
Graph $y = \sin^2 x$	$Y_1 = (\sin(x))^2$ Watch the exponent	$y_1 = (\sin x)^2$ Watch the exponent


TI-83 Plus/TI-84 Plus


TI-86

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.

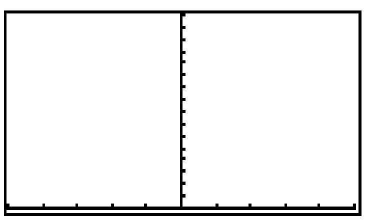

TI-83 Plus/TI-84 Plus


TI-86

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 and using %**frac.** 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.

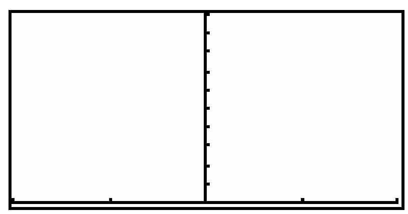
3a. Exponential functions are expressed on the TI calculators using the ^ symbol just like any other exponent. For example you can graph $y = 2^x$ by entering $y = 2 \wedge x$ into the calculator. Graph this function and record your result below.

3b. The constant $e = 2.71828...$ is found on the keyboard as e^x. It is located above the **LN** key and is accessed by **2ND LN.** The exponential function, $y = e^x$ is also found here. 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 $\ln x$ and the common logarithm $\log_{10} x$ is represented by $\log x$. 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.

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