

**MATH 1310 Programming Project #3 (TI-89 Titanium)**  
More on For Loops

You have the whole class period to work on this project with your group. Write your answers on a separate paper. Be sure to answer all questions asked.

1. Enter the following program into your calculator and run it for several inputs.

```
: loops()  
: Prgm  
: Prompt  $n$   
:  $1 \rightarrow x$   
: For  $k, 1, n$   
:  $x * 2 \rightarrow x$   
: EndFor  
: Disp  $x$   
: EndPrgm
```

- (a) Express the output of the program as a function of  $n$ .
  - (b) Explain in detail how the For loop is operating. One way to see this might be to add the commands “Disp  $x$ ” and “Disp  $k$ ” inside the loop. What happens to  $x$  and  $k$  each time through the loop?
2. Write a program that asks the user for  $n$  numbers and displays their average.
  3. Write a program to prompt the user for the initial value  $P_0$  and the continuous exponential growth constant  $r$  of an exponential growth function  $P(t) = P_0e^{rt}$ , then draw the graph of this function. Note: If you input large values for  $P_0$  you may have to zoom out to see your graph well.
  4. Write a program that prompts for the user for  $n$ , then plots  $n$  different exponential growth functions (without clearing the screen in between). For each equation, the user should input an initial value  $P_0$  and a continuous exponential growth constant  $r$ .