

MATH 113 - MAPLE ASSIGNMENT 1 - DUE OCTOBER 12, 2010

Answer all the following questions. You are expected to turn in a printout of a Maple worksheet containing the Maple commands and outputs that you used to complete the assignment. This assignment is due by October 12, 2010.

1. (10pts)
 - (a) Define the $f(x) = x^3 - 3x$ by typing in the Maple command $f := x \rightarrow x^3 - 3 * x$; at the prompt. Use Maple to evaluate the function you have defined at $x = 0$, $x = 1$, $x = -3$ (Hint: Just type in $f(0)$; $f(1)$; and $f(-3)$; at the prompt. Don't forget the semicolon!).
 - (b) Plot the graph of the function you've defined in part (a) by using the Maple plot command for the horizontal windows $[-10,10]$, $[-5,5]$, and $[-3,3]$. (Hint: Type $\text{help}(\text{plot})$; for more information and examples on how to use the plot command)
2. (10pts)
 - (a) Graph $g(x) = x \sin(1/x)$ to estimate $\lim_{x \rightarrow 0} g(x)$, zooming in on the origin as necessary.
 - (b) Confirm your estimate in part (a) with a proof.
3. (10pts) In this problem, we will use Maple to examine: $\lim_{x \rightarrow 1} \frac{x^3 - 1}{\sqrt{x} - 1}$.
 - (a) Define the function $\frac{x^3 - 1}{\sqrt{x} - 1}$ in Maple and evaluate it at the values $x = 0, 2, 0.5, 1.1, 0.99, 1.01$. Use this information to guess the value of the limit.
 - (b) Find the correct value of the limit by using Maple's limit command.