Maple Quiz #1

Calculus I: Spring 2000

Name: SOLUTIONS

Section:

Directions: Answer the questions below.

1. Each of the following lines has an error in it. Below the entry, write a CORRECTED VERSION of the same command.

\[ \text{(error is circled)} \]

Part a) I am trying to define the function \( g(x) \) to be \( x^2 + 5x \).

\[
> \text{circled}\ ^2+5*x; \\
\]

Ans: \( g := x^2 + 5x; \) or \( g := x -> x^2 + 5x; \)

Part b) I am trying to type in the exponential function, \( e^x \).

\[
> \text{circled e}^x; \\
\]

Ans: \( \exp(x); \)

Part c) I am trying to plot two functions, \( \sin(x) \) and \( x \), from \( x=0 \) to \( 2\pi \).

\[
> \text{plot}([[\sin(x),x],x=0..2*Pi)]; \\
\]

Ans: \( \text{plot}([\sin(x),x],x=0..2*Pi); \)

Part d) I am trying to type in the function \( \sin(2x) \).

\[
> \text{circled \sin(2x)}; \\
\]

Ans: \( \sin(2x); \)

Part e) I am trying to evaluate \( 5^2 + 3 - \ln(4) \).

\[
> 5^2+3-\ln(4) \text{ circled} \\
\]

Ans: \( 5^2 + 3 - \ln(4); \)
2. Suppose I have successfully defined \( h(x) \) to be the function \( \sin(2x) \), using the "mapping notation" that we’ve used in class and on the labs. What would the following commands do? (You are not being asked to evaluate the expressions; you are being asked to explain what the command tells Maple to do. Also, assume that the commands are typed in the order which they appear below.)

\[ h(2); \]

a)\[ \quad \# \quad \text{Evaluate } \sin(4). \quad \text{or} \quad \text{Evaluate the function at } x=2. \]

\[ \text{evalf(\%);} \]

b)\[ \quad \# \quad \text{Numerically approximate the above answer.} \]

\[ \text{fsolve}(h(x)=0,x); \]

c)\[ \quad \# \quad (\text{Numerically}) \quad \text{solve for the root(s) of } h(x). \quad \text{or} \quad \text{Find } x \text{ such that } h(x) \text{ is } 0. \]

\[ \text{limit}(h(x),x=0); \]

d)\[ \quad \# \quad \text{Find the limit of the function as } x \text{ approaches } 0. \]

\[ \text{hprime:=D(h);} \]

e)\[ \quad \# \quad \text{Define the function } hprime \text{ to be the derivative of } h. \]