1.(1 pt) If the tangent line to $y = f(x)$ at (4, -2) passes through the point (8, -3), find
A. $f(4) =$ _____
B. $f'(4) =$ _____

2.(1 pt) The point $P(2,11)$ lies on the curve $y = x^2 + x + 5$. If Q is the point $(x, x^2 + x + 5)$, find the slope of the secant line PQ for the following values of x.
If $x = 2.1$, the slope of PQ is: _____
and if $x = 2.01$, the slope of PQ is: _____
and if $x = 1.9$, the slope of PQ is: _____
and if $x = 1.99$, the slope of PQ is: _____
Based on the above results, guess the slope of the tangent line to the curve at $P(2,11)$. _____

3.(1 pt) The point $P(16,8)$ lies on the curve $y = \sqrt{x} + 4$. If Q is the point $(x, \sqrt{x} + 4)$, find the slope of the secant line PQ for the following values of x.
If $x = 16.1$, the slope of PQ is: _____
and if $x = 16.01$, the slope of PQ is: _____
and if $x = 15.9$, the slope of PQ is: _____
and if $x = 15.99$, the slope of PQ is: _____
Based on the above results, guess the slope of the tangent line to the curve at $P(16,8)$. _____

4.(1 pt) The point $P(0.25,8)$ lies on the curve $y = 2/x$. If Q is the point $(x, 2/x)$, find the slope of the secant line PQ for the following values of x.
If $x = 0.35$, the slope of PQ is: _____
and if $x = 0.26$, the slope of PQ is: _____
and if $x = 0.15$, the slope of PQ is: _____
and if $x = 0.24$, the slope of PQ is: _____
Based on the above results, guess the slope of the tangent line to the curve at $P(0.25,8)$. _____

5.(1 pt) If a ball is thrown straight up into the air with an initial velocity of 45 ft/s, it height in feet after t second is given by $y = 45t - 16t^2$. Find the average velocity for the time period begining when $t = 2$ and lasting
(i) 0.5 seconds _____
(ii) 0.1 seconds _____
(iii) 0.01 seconds _____
Finally based on the above results, guess what the instantaneous velocity of the ball is when $t = 2$. _____

6.(1 pt) A ball is thrown into the air by a baby alien on a planet in the system of Alpha Centauri with a velocity of 25 ft/s. Its height in feet after t seconds is given by $y = 25t - 12t^2$.
A. Find the average velocity for the time period beginning when t=1 and lasting
.01 s:_____
.005 s:_____
.002 s:_____
.001 s:_____
NOTE: For the above answers, you may have to enter 6 or 7 significant digits if you are using a calculator.
B. Estimate the instanteneous velocity when t=1.

7.(1 pt) The experimental data in the table below define y as a function of x.

x	0	1	2	3	4	5
y	2	0.7	0.4	0.6	1.2	2.2

A. Let P be the point (4, 1.2). Find the slopes of the secant lines PQ when Q is the point of the graph with x coordinate x1.

x1	0	1	2	3	5
slope	—	—	—	—	—

B. Draw the graph of the function for yourself and estimate the slope of the tangent line at P.

8.(1 pt) Below is an "oracle" function. An oracle function is a function presented interactively. When you type in an t value, and press the –f–> button and the value $f(t)$ appears in the right hand window. There are three lines, so you can easily calculate three different values of the function at one time.

The function f(t) represents the height in feet of a ball thrown into the air, t seconds after it has been thrown.

Calculate the velocity 0.8 seconds after the ball has been thrown.

The velocity at 0.8 = _____ You can use a **calculator**

t	→	f(t)
Enter t	→	result: $f(t)$
Enter t	→	result: $f(t)$
Enter t	→	result: $f(t)$

Remember this technique for finding velocities. Later we will use the same method to find the derivative of functions such as $f(t)$.

9.(1 pt) The position of a cat running from a dog down a dark alley is given by the values of the table.

t(seconds)	0	1	2	3	4	5
s(feet)	0	15	22	73	96	109

A. Find the average velocity of the cat (ft/sec) for the time period beginning when t=2 and lasting
a) 3 s _____
b) 2 s _____
c) 1 s _____
B. Draw the graph of the function for yourself and estimate the instantaneous velocity of the cat (ft/sec) when t=2