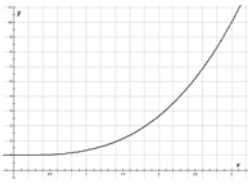
1.



Small HW #1 Graph
Use large version for work
Download more than copy from hw page as needed

a. Use the HW #1 graph page and carefully sketch tangent lines at $x = 0$, $x = 1$, $x = 2$ and $x = 3$ for this function. Estimate the slope of each tangent line as accurately as you can and determine the equation of each tangent line. You may wish to sketch parallel lines that go through "good" grid points to find slope. Clearly show all of your work.

b. Fill out an input (x) / output (slope at x) table such as:

x	0	1	2	3
Slope at x				

c. Determine a formula for the instantaneous rate of change for this function.

2. Use Fermat's Method to compute the derivative of $y = mx + b$ where m and b are any real numbers. Explain your result.

3.

a. Use Fermat's Method to compute the derivative of $y = (x-2)^2$. Hint: To compute $(x+h-2)^2$, think of h - 2 as "one number," then multiply in stages. The first stage is: $(x+[h-2])^2 = x^2 + 2x(h-2) + (h-2)^2$.

b. Sketch $y = (x-2)^2$ and $y = x^2$ together on the same grid.

c. Sketch the tangent line at $x = 1$ for $y = x^2$ and determine the equation for the line.

d. For which value of x is the tangent line for $y = (x-2)^2$ parallel to the tangent line at $x = 1$ for $y = x^2$? Give the point, sketch the line and determine the equation for the line. Label clearly.

4.

a. Use Fermat's Method to compute the derivative of $y = -(x-2)^2$.

b. Sketch $y = -(x-2)^2$ and $y = (x-2)^2$ together on the same grid.

c. Sketch the tangent line at $x = 1$ for $y = (x-2)^2$ and the tangent line at $x = 1$ for $y = -(x-2)^2$ and determine the equation for each line. Label clearly.

d. How does the derivative of $y = -(x-2)^2$ compare to derivative of $y = (x-2)^2$? How can you see this in your graphs? Explain.

HW #1 Graph