Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Unit 2 – Derivatives Free Response Problem Set**

The graph of the function *f* and a table of selected values of $f(x)$ are shown above. The graph of *f* has a horizontal tangent line at $x=4$, is concave down for $0<x<6$, and is linear for $x\geq 6$.

1. (2 pts)Approximate the value of $f'(5.5)$ using the data from the table. Show the computations that lead to your answer.
2. (2 pts) Is there a value of *x*, for $0<x<6$, such that $\lim\_{x\to 0}\frac{f\left(x+h\right)-f(x)}{h}=0$? Show all work.
3. (1 pt) Find the value, or explain why it does not exist. $\lim\_{x\to 0}\frac{f\left(6+h\right)-f(6)}{h}$