MATH 1151 – Precalculus Supplemental Lab
Conceptual Activity – Week 2

NAME: _____   **SECTION:** _____

1. Let f be a function. Consider the points

$$\big(x, f(x)\big) \quad \text{and} \quad \big(x + h, f(x + h)\big),$$

   where h is some number not equal to 0, thereby making these two points distinct from each other.

   (a) Find an expression for the slope between the two above points. Simplify the denominator of your expression. *Hint:* Do not overthink this. Recall the formula for slope between two points:

   $$\frac{y_2 - y_1}{x_2 - x_1}.$$

   (b) Have you seen your answer to (a) before? Does it have a name?

   (c) Assume the graph of f is a nonlinear curve. Come up with a (general) graphical representation of your answer from (a), based on the fact that it is a slope. Your picture should include the curve f, "something" that has a slope, and the labels x, $x + h$, $f(x)$, $f(x + h)$. What aspect of your picture corresponds to the value of the expression from (a)?

2. **Verify your answer to the previous problem with the instructor before continuing.**

   Compute the difference quotient for the following. Simplify until the h in the denominator cancels.

   (a) $f(x) = x^2 - 6x$.

   (b) $f(x) = \dfrac{1}{x}$.