1. On the same graph, plot both $f(x) = x^3 - 3x - 5$ and its derivative on the interval $[-4, 4]$. What do you notice? In particular, what appears to be true about $f(x)$ when its derivative is zero? What appears to be true about $f(x)$ when its derivative is positive? is negative?

2. Let $g(x) = \dfrac{x+4}{x+9}$.

   a. Find the critical numbers of $g(x)$, if any.

   b. Find the maximum and minimum value of $g(x)$ on the interval $[1, 6]$.

3. Let $h(x) = e^x(x - 5)$.

   a. Find the critical numbers of $h(x)$, if any.

   b. Find the maximum and minimum value of $h(x)$ on the interval $[0, 6]$.

4. Let $g(x) = x^2 + 3x + 1$. Find a value c in the interval $[3, 9]$ such that $g'(c)$ equals the average rate of change of $g(x)$ on the interval $[3, 9]$.