1. Let $f(x) = 5 + 3x - 4x^2$.

   (a) Find the slope of the tangent line to the graph of f at $(x, f(x))$.

   (b) Find the slope of the tangent line to the graph of f at $(3, -22)$.

   (c) Find the slope of the tangent line to the graph of f at $(-2, -17)$.

   (d) Find the slope of the tangent line to the graph of f at the point with x-coordinate 100.

   (e) Find the slope of the tangent line to the graph of f at the point with y-coordinate -5.

   (f) Find the point(s) on the graph of f at which the slope of the tangent line is 35.

   (g) Find the equation of the tangent line to the graph of f at the point whose x-coordinate is 1.

2. The position function s of a point P moving on a coordinate line ℓ is given by $s(t) = 8t + \frac{2}{t}$.

   (a) Find the average velocity of P in the following time intervals: $[4, 4.1]$, $[4, 4.01]$, $[4, 4.001]$. (Round your answers to the nearest hundred-thousandth)

   (b) Find $v(t)$, the velocity of P at time t.

   (c) Find the velocity of P at $t = 4$.

   (d) In which direction is the point moving at $t = 4$?

   (e) When is the velocity of the object 6?

   (f) When does the point reverse direction?

3. Let $f(x) = x^3 - 3x + 7$.

(a) Use the definition of the derivative to find $f'(x)$.

(b) Find the equation of the tangent line to the graph of f at the point whose x-coordinate is -2.

(c) Find the points on the graph of f at which the tangent line is horizontal.

(d) Find the points on the graph of f at which the tangent line is parallel to the line $24x - y = 17$.