Math 104 90A[1] September 15th, 1999 Worksheet 2

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1. The distance travelled by a car at time t from a particular city is given by the function $y = f(t) = 3t^2$.
   (a) Find the slope of the secant line m_{sec}, joining the points $P(1,3)$ and the point $Q(2,12)$. What is the practical meaning of m_{sec} in this case ?
   (b) Find the slope of the curve $y = f(t) = 3t^2$ at the point $P(1,3)$. What is the practical meaning of the slope in this case ?

2. Let $f(x) = 3(|x - 8|)$.
   (a) Graph the function f.
   (b) Graph the derivative function.
   (c) Does the derivative exists always ? Please explain your answer.

3. Let $f(x) = x^3$.
   (a) If P is the point $(2,8)$ on the graph of f, find the equation of the tangent line at P in the form $y = m(x-2) + b$.
   (b) Sketch the graph of f and the tangent line we found in part a.
   (c) Using the above give an approximation of the following
      i. $f(2.1)$
      ii. $(1.9)^3$
   (d) Determine the relative and percentage rates of change of f at $x = 2$.

[1] **Office hours:** Monday:1:45-3:15pm, Tuesday:3:30-5:30pm, Wednesday 2:15-3:15pm