**Math 181 - homework 1**

Show your work, in particular describe any input you gave to a calculator/computer. But do not list the actual data - no need to copy, no need to print out this paper. Give exact answers, no decimal fractions. This is an individual assignment.

**Problem 1** Suppose the concentration of a pollutant in a pond is given as a function of time $t$ by

$$p(t) = \frac{0.1t + 3}{2t^2 - t + 2}$$

a) Find the derivative of $p(t)$ using the Quick Rules.
b) Find the instantaneous rate of change of $p(t)$ at $t = 1$ and $t = 2$.
c) Given that $p(2) = 0.4$, approximate the concentration at time $t = 2.1$ using the equation for the tangent line to the graph of $p(t)$ at $t = 2$.
d) Find the interval(s) where $p(t)$ is decreasing, and the interval(s) where it is increasing.
e) When is the concentration of the pollutant maximal?