Written Homework Problems §3.1

15 problems for 30 points

§3.1 #4,9,12,15,16,20,23,25,39,41,46,47

(Problem A) This is a continuation of #46 above where you used average velocity over smaller and smaller intervals to guess the instantaneous velocity of a ball at $t = 5$ seconds. Use equation 3.6 from your book to confirm your guess. (That is, use equation 3.6 to find $s'(5) = v(5)$ for the function $s(t) = 14t^2$.)

(Problem B) The population of fruit flies in a compost bin is modeled by the the function $P(t) = 4\sqrt{t+1}$ where t is measured in weeks and P is measured in hundreds of fruit flies. Use equation 3.6 to find $P'(3)$ and *interpret* your answer. Include units and make your interpretation a complete sentence that a member of the public could understand.

(Problem C) A company models its profit by a function $P(x)$ where x is the number of widgets produced and sold and P is the profit in thousands of dollars for producing and selling x widgets. The company finds that $P'(100,000) = -50$. What should the company conclude from this calculation? Your answer should be in complete sentences such that a member of the public could understand and should include units.