MA 16020 LESSON 2: INTEGRATION BY SUBSTITUTION (PROBLEM SET)

Example 1: **Find the average value of $f(x) = 6x^2 + 2$ over $[1, 3]$.**

Example 2: **Find the average value of $f(x) = \frac{2x}{x^2+1}$ over** $[0,5]$**.**

<u>Example 3:</u> After t months on the job, a postal clerk can sort

$$Q(t) = 700 - 400e^{-0.5t}$$

Letters per hour. What is the average rate at which the clerk sorts mail during the first 3 months on the job? Round your answer to two decimal places.

<u>HW 2.3:</u> A certain plant grows at the rate $H'(t) = \frac{1}{\sqrt[3]{8t+3}}$ inches per day, t days after it was planted. How many inches will the height of the plant change on the third day? Round answer to 3 decimal places.

<u>Example 4:</u> Suppose as a particle slows down, its velocity is:

$$v(t) = 2e^{1-t} - 1 \qquad \text{cm/s}$$

If the particle starts slowing down at time $t = 0$ seconds, find the distance it takes for the particle to stop. Round your answer to two decimal places.