

Group #

Worksheet week 2 - MAC 2312, Spring 2019

NAME: _____

1. Use FTC or geometry to evaluate each integral:

(a) $\int_1^2 \frac{x^2 + 1}{x} dx$

(b) $\int_0^{\pi/3} \sec^2 x dx$

(c) $\int_0^3 \sqrt{6x - x^2} dx$ Hint: Complete the square and graph $y = \sqrt{6x - x^2}$

2. Suppose a gauge at the outflow of a reservoir measures the flow rate of water $r(t)$, in ft^3/min , at t minutes since the valve is open.(a) In one sentence, explain what the following integral represents: $\int_2^6 r(t) dt$ (b) Suppose now the flow rate is given by the function $r(t) = \begin{cases} 50t & \text{if } 0 \leq t \leq 4 \\ 200 & \text{if } 4 < t \leq 10 \end{cases}$ Graph this function.(c) With the function $r(t)$ from part (b), find the total amount of water that flows out of the reservoir in the interval $[0, 10]$ minutes.