

HW1 Q6

Note Title

1/12/2016

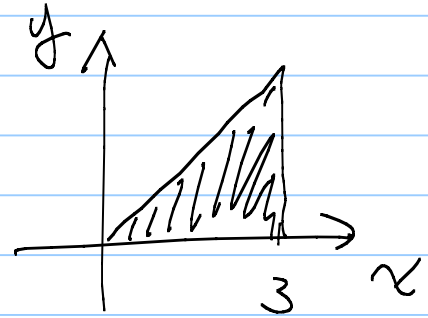
$$f(x, y) = \begin{cases} \frac{2}{9} & \text{if } x \in [0, 3], y \in [0, x] \\ 0 & \text{otherwise.} \end{cases}$$

Q1: $f(2, 2.01) = ?$

$f(1, 0.33) = ?$

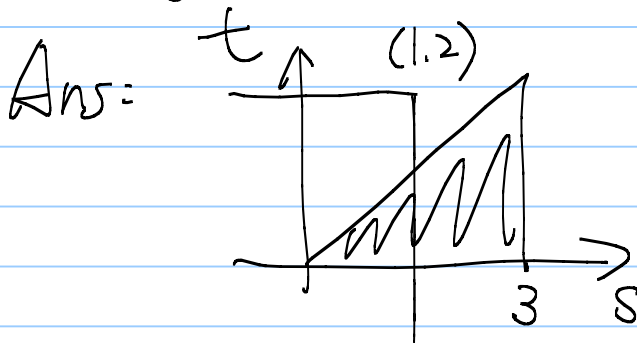
A1: $f(2, 2.01) = 0$

$f(1, 0.33) = \frac{2}{9}$



Q2: $g(x, y) = \int_{t=-\infty}^y \int_{s=-\infty}^x f(s, t) ds dt.$

$g(1, 2), g(2, 2.01) = ?$



$$\Rightarrow g(1, 2) = \int_{t=0}^1 \int_{s=t}^1 \frac{2}{9} ds dt$$

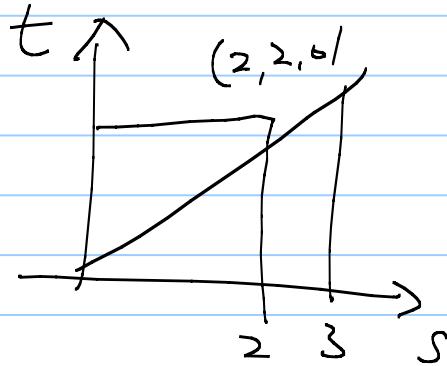
$$= \int_{t=0}^1 \frac{2}{9} s \Big|_{s=t}^1 dt$$

$$= \int_{t=0}^1 \left(\frac{2}{9} - \frac{2}{9}t \right) dt$$

$$= \left(\frac{2}{9}t - \frac{1}{9}t^2 \right) \Big|_{t=0}^1$$

$$= \frac{1}{9} - 0 = \frac{1}{9}$$

$$f(2, 2.01) =$$



$$= \int_{t=0}^2 \int_{s=t}^2 \frac{2}{9} ds dt$$

$$= \frac{4}{9}$$