

5. [6 pts.] Find the slope of the curve  $xy + y^2 = 1$  at the point  $(0,1)$ .

$$\text{slope} = dy/dx : y + x \frac{dy}{dx} + 2y \frac{dy}{dx} = 0$$

$$\text{evaluate at } (0,1) \rightarrow 1 + 2 \frac{dy}{dx} = 0$$

$$\Rightarrow \frac{dy}{dx} = -\frac{1}{2}$$

Final answer:

$$-\frac{1}{2}$$

6. [6 pts.] Consider the table of values for the function  $f$ :

x	0	20	40	60	80	100
f(x)	1.2	2.8	4.0	3.2	5.1	5.2

Give upper and lower estimates to the value of the integral  $\int_0^{100} f(x) dx$ . Show your work.

lower estimate: replace  $f$  w/ lowest value in table.

$$\Rightarrow \int_0^{100} f(x) dx \geq 100 \cdot 1.2 = 120$$

upper estimate: replace  $f$  w/ ~~lowest~~ highest value in table:

$$\Rightarrow \int_0^{100} f(x) dx \leq 5.2 \cdot 100 = 520$$

lower estimate: 120

upper estimate: 520