

Math 250a (Kennedy) - Quiz 8 - Fall '07

1. The table gives some values of $f(x)$. Compute the following approxima-

x	0.0	0.25	0.5	0.75	1.0
f(x)	1	2	4	6	9

tions to $\int_0^1 f(x) dx$. The "(2)" means we use $N = 2$ subdivisions of $[0, 1]$.

(a) LEFT(2)

$$0.5 (1 + 4) = 2.5$$

(b) RIGHT(2)

$$0.5 (4 + 9) = 6.5$$

(c) TRAP(2)

$$0.5 \left(\frac{1}{2} (1 + 4) + \frac{1}{2} (4 + 9) \right) = 4.5$$

(d) MID(2)

$$0.5 (2 + 6) = 4$$

2. Find the solution of the differential equation $yy' - x \cos(x^2) = 0$ with the initial condition $y(0) = -1$.

$$y \frac{dy}{dx} = x \cos(x^2)$$

$$\int y dy = \int x \cos(x^2) dx$$

$$\frac{1}{2} y^2 = \frac{1}{2} \sin(x^2) + C$$

$$y = \pm \sqrt{\sin(x^2) + C'}$$

To get $y(0) = -1$ take

$$y = -\sqrt{\sin(x^2) + C'}$$

$$-1 = -\sqrt{0 + C'} \quad \text{so} \quad C' = 1$$

$$y = -\sqrt{\sin(x^2) + 1}$$