

King Fahd University of Petroleum and Minerals
Department of Mathematical Sciences
(Term 042) MATH 102
Quiz# 1

Name: Solution B ID# _____ Sec.#: _____

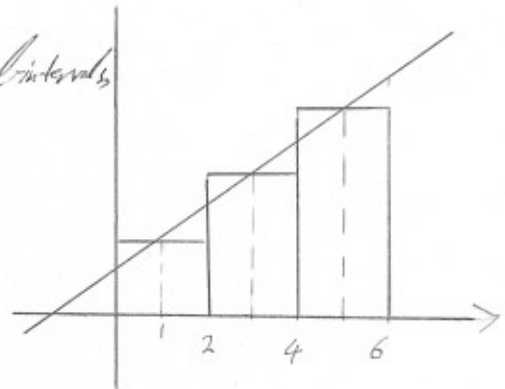
1. Approximate the area between the graph of $f(x) = 2x + 1$ and the interval $[0, 6]$ using 3 rectangles.

$$n = 3$$

Divide the interval $[0, 6]$ into 3 equal sub-intervals,
each of length $\frac{6}{3} = 2$

In each sub-interval determine its midpoint

So, the midpoints are: 1, 3, 5



The approximated area is

$$A_3 = 2 [f(1) + f(3) + f(5)] \\ = 2 [3 + 7 + 11] = 42$$

2. Integrate each of the following:

(a) $\int \left(\frac{3}{x^2} - \frac{2}{x} + 2e^{3x} \right) dx.$

$$= -\frac{3}{x} - 2 \ln|x| + \frac{2}{3} e^{3x} + C$$

(b) $\int \frac{dt}{\csc t}$

$$= \int \sin t \, dt = -\cos t + C$$

(c) $\int 3x(1 + 2x)^2 dx$

$$= \int 3x(1 + 4x + 4x^2) dx = \int (3x + 12x^2 + 12x^3) dx$$

$$= \frac{3}{2}x^2 + 4x^3 + 3x^4 + C$$