King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 102 (162) Sec 30 - Quiz 1

Name: ID: Serial No.:

1. Using three approximating rectangles and midpoints, to approxinate the area under the graph of $f(x) = \dfrac{x}{x-1}$ from $x = 2$ to $x = 8$

2. Using the definition of the definite integral, to find the value of the limit

$$\lim_{n\to\infty} \sum_{i=1}^{n} \frac{2}{n} \sqrt{4 + \frac{3i}{n}}$$

3. By interpreting it as an area, find the value of the integral

$$\int_0^1 (|x-1| + 2\sqrt{1-x^2})dx$$

4. Find the slope of the tangent line to the graph of the function $f(x) = \int_{\tan x}^{1} \frac{1}{\sqrt{1+t^2}} dt$ at $x = \frac{\pi}{3}$.

5. Find the value of the integral $\int_0^1 \frac{x^3+x^2+x+1}{x+1}dx$

6. If f is an even function and $\int_{-2}^{2} f(x)dx = 4$ and $\int_{-2}^{7} f(x)dx = 5$. Then find the value of $\int_0^7 f(x)dx$

7. Use the properties inegral of integrals to verify the following inequality

$$\frac{\sqrt{2}\pi}{24} \leq \int_{\pi/6}^{\pi/4} \cos x \, dx \leq \frac{\sqrt{3}\pi}{24}$$