Practice Exam

January 21, 2009

1 Estimate the area under the graph $f(x) = \cos x$ from 0 to $\frac{\pi}{2}$ using four approximating rectangles and midpoints. Sketch the graph and the rectangles.

2 Express the following limit as a definite integral in the interval $[2, 6]$:

$$\lim_{n\to\infty} \sum_{i=1}^{n} x_i \; ln(1 + x_i^2) \; \Delta x$$

3 Evaluate the following integral:

$$\int_0^{10} \Big|x - 5\Big| \; dx$$

4 Find the derivative of the following function:

$$g(x) = \int_{\tan x}^{x^2} \frac{1}{\sqrt{2 + t^4}} dt$$

5 If $F(x) = \int_1^x f(t) \; dt$, where $f(t) = \int_1^{t^2} \frac{\sqrt{1+u^4}}{u} du$, find $F^{''}(2)$.

6 If $f(1) = 12$, $f^{'}$ is continuous and $\int_1^4 f^{'}(x) \; dx = 17$, what is the value of $f(4)$.

7 Evaluate the following integral:

$$\int \frac{e^x}{e^x + 1} \; dx$$

8 Evaluate the following integral:

$$\int_{-\pi}^{\pi} \sin^5 x \; dx$$

9 Evaluate the following integral:

$$\int_0^{10} 3x^2 + x - 10$$

10 Who is the best superhero? (Circle the answer or write in another one)

$$Spider - Man \; , \; Superman \; , \; Batman \; , \; Captain \; America \; , \; Daredevil$$

$$Green \; Lantern \; , \; Wolverine \; , \; Buffy \; , \; Angel \; , \; Tim \; Gunn$$

$$Ozymandias \; , \; Rorschach \; , \; Mr. \; Fantastic \; , \; El \; Santo \; , \; Other$$