

Name:

Student ID#:

SR#

Q1) Estimate the area under the graph of $f(x) = \frac{x}{x+1}$, $0 \leq x \leq 6$, using three approximating rectangles and midpoints.

Q2) If $f(x) = \int_{\sec x}^{\cos x} \sqrt{1+t^2} dt$ and $g(y) = \int_1^y f(x) dx$, find $g''\left(\frac{\pi}{4}\right)$.

Q3) Evaluate the following limit.

$$\lim_{n \rightarrow \infty} \frac{4}{n} \left(\frac{1^{11}}{n^{11}} + \frac{2^{11}}{n^{11}} + \frac{3^{11}}{n^{11}} + \dots + \frac{n^{11}}{n^{11}} \right)$$

Q4) Evaluate the following integral.

$$\int (x^e + e^x + e^e) dx$$