10.4 Integral Test for Convergence

Calculus Name: _____ **CA #1**

1. Use the Integral Test to determine the convergence or divergence of the series $\sum_{n=1}^{\infty} \frac{1}{n^5}$.

2. Confirm the Integral Test can be applied to the series $\frac{3}{2} + \frac{3}{5} + \frac{3}{10} + \cdots$ and use the Integral Test to determine the convergence or divergence of the series.

3. Explain why the Integral Test does not apply to the series $\sum_{n=1}^{\infty} \frac{1}{e^{-n}}$.

4. Prove the Integral Test applies to the series $\sum_{n=1}^{\infty} \frac{1}{(n+1)^3}$. Determine the convergence or divergence of the series.

5. Use the Integral Test to determine if the series $\sum_{n=1}^{\infty} \frac{4n}{2n^2+1}$ converges or diverges.

Answers to 10.4 CA #1

1. $\int_1^{\infty} f(x)\,dx = \frac{1}{4}$, Series Converges	2. $\int_1^{\infty} f(x)\,dx = \frac{3\pi}{4}$, Series Converges	3. $f(x)$ is not a decreasing function for $x \geq 1$.
4. $\int_1^{\infty} f(x)\,dx = \frac{1}{8}$, Series Converges	5. $\int_1^{\infty} f(x)\,dx = \infty$, Series Diverges	