

1. (1 pt) Compute the value of the following improper integral if it converges. If it diverges, enter INF if it diverges to infinity, MINF if it diverges to minus infinity, or DIV otherwise (hint: integrate by parts).

$$\int_1^{\infty} \frac{9 \ln(x)}{x^3} dx$$

Determine whether

$$\sum_{n=1}^{\infty} \left( \frac{9 \ln(n)}{n^3} \right)$$

is a convergent series. Enter C if the series is convergent, or D if it is divergent. \_\_\_\_

2. (1 pt) Find the value of

$$\int_2^{\infty} \frac{dx}{(2x-2)^2}$$

Determine whether

$$\sum_{n=2}^{\infty} \left( \frac{1}{(2n-2)^2} \right)$$

Enter C if series is convergent, D if series is divergent. \_\_\_\_

3. (1 pt) Find the value of  $\int_1^{\infty} \frac{4dx}{x^2+1}$

Determine whether  $\sum_{n=1}^{\infty} \left( \frac{4}{n^2+1} \right)$

Enter A if series is convergent, B if series is divergent. \_\_\_\_

4. (1 pt) Find the value of  $\int_1^{\infty} 5x^2 e^{-x^3} dx$

Determine whether  $\sum_{n=1}^{\infty} (5n^2 e^{-n^3})$

Enter C if series is convergent, D if series is divergent. \_\_\_\_

5. (1 pt) Evaluate

$$\int_2^{\infty} \frac{dx}{7x(\ln(3x))^2}$$

Answer: \_\_\_\_

Determine whether the following series is convergent.

$$\sum_{n=2}^{\infty} \frac{1}{7n(\ln(3n))^2}$$

Enter C if series is convergent, D if series is divergent: \_\_\_\_