

# Math 199 CD3 Merit Worksheet: Improper Integral

February 8, 2022

1. For  $p \leq 1$ , is  $\int_1^\infty \frac{\ln x}{x^p} dx$  convergent?

2. Evaluate  $\int_a^\infty x e^{-x} dx$

3. Show that  $\int_e^\infty \frac{dx}{\ln^p x}$  converges

4. Evaluate  $\int_0^\infty \frac{dx}{2^{-x} + e^x} dx$

5. Evaluate  $\int_0^\infty x^3 e^{-x} dx$

6. Evaluate  $\int_0^{\pi/2} \sec(x) dx$