

8. [7 points] Consider the integral

$$\int_1^{\infty} \frac{e^{rx}}{x} dx,$$

where r is a constant.

- a. [3 points] Show that this integral converges for $r < 0$. **Show all work and indicate any convergence tests used.**

- b. [4 points] Show that the integral diverges for $r \geq 0$. **Show all work and indicate any convergence tests used.**