

1 Evaluate the integral

5 points

$$\int_1^3 x^x(1 + \ln x)dx.$$

2 For positive real numbers r, s , find the following limits:

5 points

(a) $\lim_{x \rightarrow \infty} \frac{\ln x}{x^r},$

(b) $\lim_{x \rightarrow \infty} \frac{x^s}{e^x}.$