

(1)[5 points] Evaluate

$$\int_1^{\infty} \frac{\ln x}{x^2} dx$$

(2)[5 points] Determine if the following integral converges or diverges (it is easiest to use the Comparison Theorem here):

$$\int_1^{\infty} \frac{1}{x + e^{2x}} dx$$

(3)[5 points] Find the area bounded by  $y = 1/x$ ,  $y = x$  and  $y = x/4$  where  $x > 0$ . (Sketch the area in question first).