
Please show your work!

1) Determine whether the following integral converges or diverges, if it converges, evaluate it.

a) $\int_0^{\infty} \frac{3}{x^2 + 10x + 16} dx,$

b) $\int_{-1}^{\infty} \frac{e^{-\sqrt{x+2}}}{\sqrt{x+2}} dx.$

2) Sketch the region and find its area (if the area is finite).

$$S = \{(x, y) \mid x \leq 1, \quad 0 \leq y \leq e^x\}$$