

1. Determine whether the improper integral converges or diverges. If it converges find its value. **Important:** Show clearly how limits are involved.

(a) $\int_0^{\infty} x e^{-x^2} dx$

(b) $\int_0^{\infty} \frac{x}{\sqrt{x^2 + 1}} dx$

2. Determine whether this improper integral converges or diverges. If it converges find its value. **Important:** Show clearly how limits are involved.

$$\int_1^2 \frac{1}{\sqrt{x-1}} dx$$