

1. (10 points) Evaluate each of the following:

a.  $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x^2}$

b.  $\lim_{x \rightarrow 0} x e^{-2x}$ .

2. (10 points) Evaluate the following integrals:

a.  $\int_0^{\infty} x e^{-4x} dx$

b.  $\int_0^1 \frac{1}{\sqrt{1-x}} dx$ .