

**Problem 1:** (4 points each) Evaluate the integral

(a)  $\int (u^e + e^u) du$

(b)  $\int \frac{x}{\sqrt{ax^2 + b}} dx$

(c)  $\int \frac{\ln^3 x}{3x} dx$

**Problem 1:** (4 points each) (a) Use differentials to approximate  $\sqrt{122}$

(b) Evaluate the integral  $\int_1^2 \frac{1}{1+e^x} dx$

(c) Find the area enclosed by the graphs of  $y = x^2 - 2x$  and  $y = 12 - x^2$