**Question 1:** (6 points each) Evaluate the following integrals:

(a) $\int x\, e^{x^2} dx$

(b) $\int\limits_{1}^{2} \dfrac{x+1}{x}\, dx$

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

(d) $\int 2^{x+2}\, 5^x\, dx$

**Question 2:** (a) (7 Points) Use differentials to approximate $\sqrt[4]{17}$ .

(b) (9 Points) Find the area enclosed by the graphs of $y = -1 - x$ and $y = 1 - x^2$ .