

4. (10 pts)

(a) Find the linearization $L(x)$ of $f(x) = \sqrt{x}$ at $a = 1$ and then find for what values of x the approximation $f(x) \simeq L(x)$ is accurate within 0.5.

(b) Find the Taylor polynomial $T_3(x)$ of $f(x) = \frac{\ln x}{x}, x > 0$ about $x = 1$.

5. (10 pts) Let $f(x) = e^{x^2}, x \in \mathbb{R}$.

(a) Find the Taylor polynomial $T_{2n}(x)$ of f about $x = 0$ by using the n -th Taylor polynomial about $x = 0$ of function $g(x) = e^x$.

(b) Use (a) to calculate $f^{(n)}(0)$.