Calculus I
Homework
Linearization and differentials

1.

(a) Find the linearization of $f(x) = \sqrt{x}$ at $a = 100$ and use it to approximate $\sqrt{99.8}$.

(b) Find the linearization of $f(x) = \sqrt{8 + x}$ at $a = 1$ and use it to approximate $\sqrt{9.02}$.

(c) Find the linearization of $f(x) = \sqrt[3]{8 + x}$ at $a = 0$ and use it to approximate $\sqrt[3]{7.97}$.

(d) Find the linearization of $f(x) = \ln x$ at $a = 1$ and use it to approximate $\ln 1.01$.

(e) Use a linear approximation to estimate $(1.001)^9$.

(f) Use a linear approximation to estimate $(0.9999)^{2014}$.