Exercise 1 Find the linearization $L(x)$ of the function $f(x) = 2^x$ at $a = 0$.

Exercise 2 Let $y = \frac{x+1}{x-1}$. Find the differential dy and evaluate dy for $x = 2$ and $dx = 0.05$.

Exercise 3 Let $y = x - x^3$. Let $x = 0$ and $\Delta x = -0.3$. Compute Δy and dy. Sketch to show the line segments with lengths dx, dy, and Δy.

Exercise 4 Use a linear approximation to estimate $\cos(29°)$.

Exercise 5 The radius of a circular disk is given as 24 cm with a maximum error in measurement of 0.2 cm.

(a) Use differentials to estimate the maximum error in the calculated area of the disk.

(b) What is the relative error? What is the percentage error?