1. Let $y = \sqrt{x}$.

   (a) Find the differential dy.

   (b) Evaluate dy and Δy if $x = 1$ and $dx = \Delta x = 1$.

   (c) Sketch a diagram showing the line segments with lengths dx, dy, and Δy.

2. Find the differential of the function

$$f(x) = \frac{x \sin\left(\frac{x}{x+1}\right)}{\cos x}$$