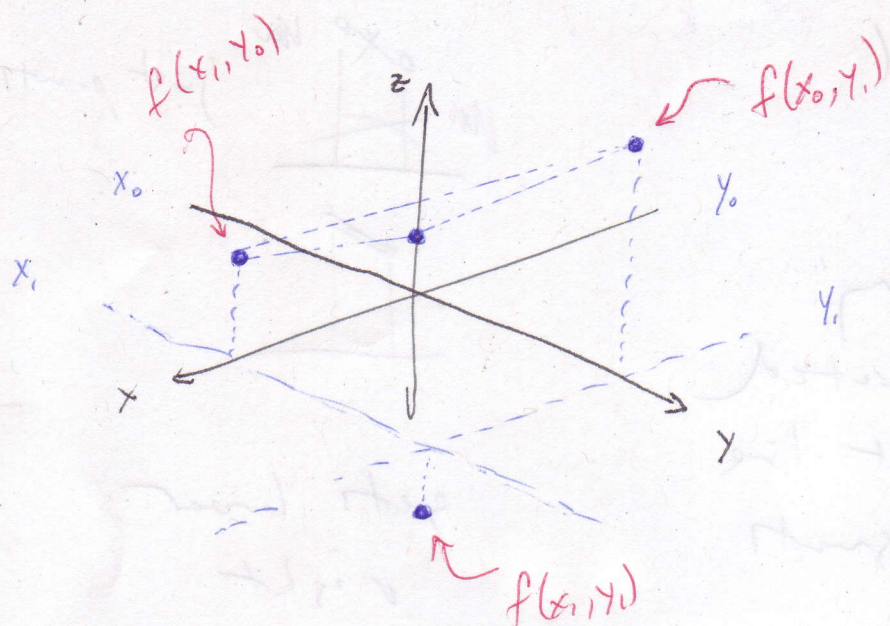


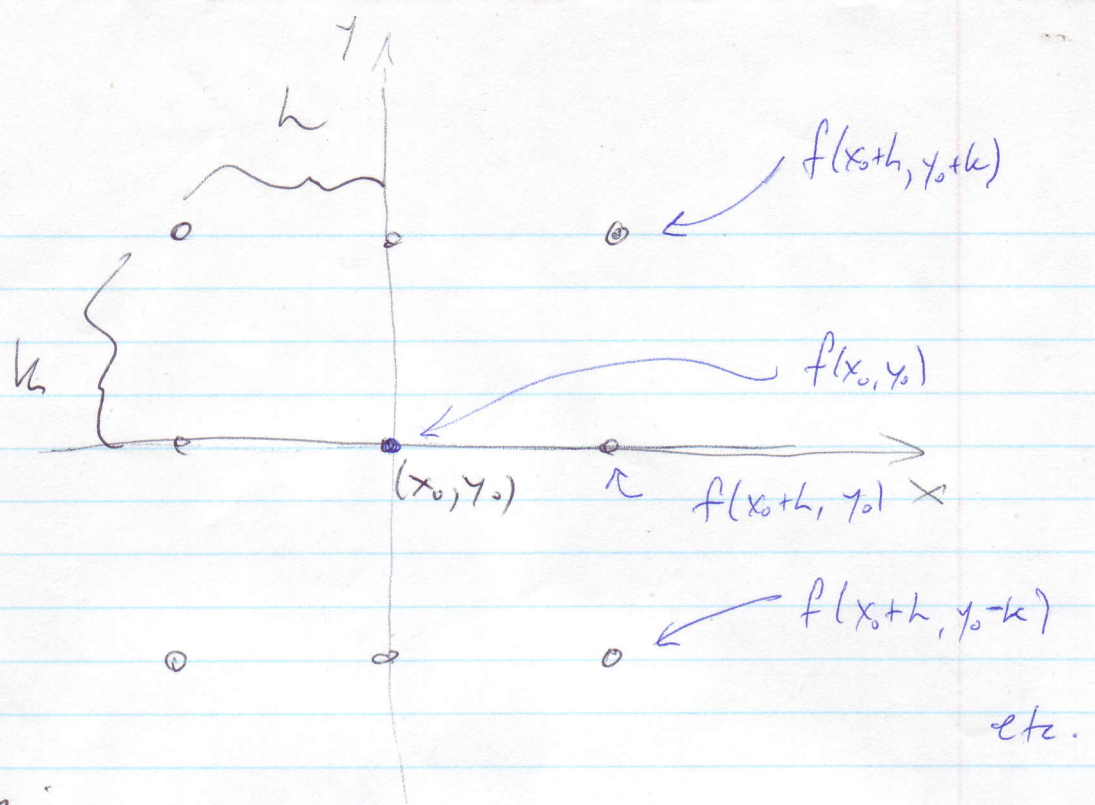


There are four different "secant planes" we can fit.

① Fit the one at (x_0, y_0) ; passing through its two nearest neighbors:

② Integrate that over the region $[x_0, x_1] \times [y_0, y_1] = R$:

③ Observe that its "volume" is its midpoint value times the area of R .



Estimate:
(centered)

$$f_x(x_0, y_0) \approx$$

$$f_y(x_0, y_0) \approx$$

$$f_{xx}(x_0, y_0) \approx$$

$$f_{yy}(x_0, y_0) \approx$$

$$f_{xy}(x_0, y_0) \approx$$