(a) If we start at (x_0, y_0) and move in the positive x-direction, the graph of f increases. Thus $f_x(x_0, y_0)$ is positive.

(b) If we start at (x_0, y_0) and move in the positive y-direction, the graph of f decreases. Thus $f_y(x_0, y_0)$ is negative.