Homework 3.8 Level Surfaces
MultiV 2021-22 / Dr. Kessner

For each of these problems, visualize the surfaces and tangent planes, and guess the answer before you do the calculation. Have fun!

Also, please do these exercises from the textbook: OSC3 4.6 # 303a, 305a

1. Consider the cylinder $x^2 + y^2 = 4$ (in $\mathbb{R}^3$). Find the tangent plane to the surface at the points $(2, 0, 0)$, and $(0, 2, 10)$. *Hint:* The surface is a level set of the function $F(x, y, z) = x^2 + y^2$.

2. Find the tangent plane to the cone $z = \sqrt{x^2 + y^2}$ at the points $(1, 0, 1)$ and $(0, 1, 1)$. *Hint:* Consider the function $G(x, y, z) = z^2 - x^2 - y^2$ (why?).