1. (20 points) Find the domain for the following function:

$$g(x, y) = \frac{\log(2 - x)}{1 - x^2 - y^2}$$

2. (20 points) Sketch and describe level curves for $k = 0, \pm 1$ for $f(x, y) = xy$

3. (20 points) Sketch and describe level curves for $k = 0, 1, 4$ for $f(x, y) = x^2 + y^2$