14.1, number 39: **Let** $f(x, y) = x^2 + y^2$.
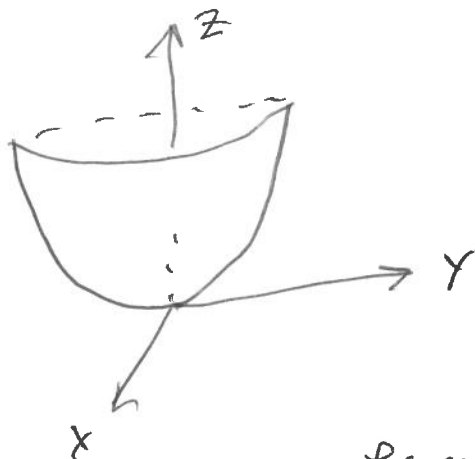
(a) **Graph the surface** $z = f(x, y)$.

(b) **Draw a few level sets of** f.
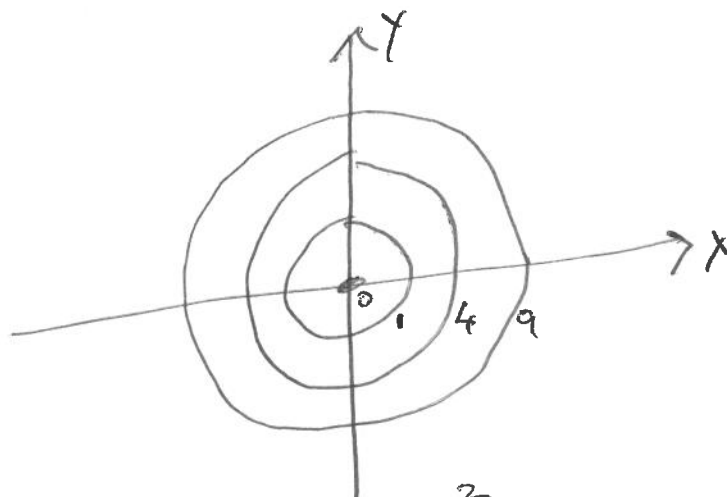
Answer:
   The surface is a paraboloid. The level sets are circle with center $(0, 0)$. There is a picture on the next page.

Picture 14.1   number 39

The graph of $z = f(x,y)$ for $f(x,y) = x^2 + y^2$

The level sets of $f(x,y) = x^2 + y^2$
we drew $f(x,y) = 0$ The origin
          $f(x,y) = 1$ The circle with radius 1 and center $(0,0)$
          $f(x,y) = 4$ The circle with radius 2 and center $(0,0)$
          $f(x,y) = 9$ The circle with radius 3 and center $(0,0)$