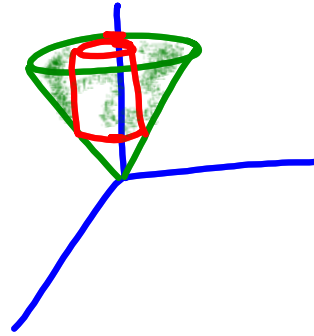


41. Sketch the region bounded by the surfaces  $z = \sqrt{x^2 + y^2}$  and  $x^2 + y^2 = 1$  for  $1 \leq z \leq 2$ .



43. Find an equation for the surface obtained by rotating the parabola  $y = x^2$  about the y-axis.

$$y = x^2 + z^2$$

45. Find an equation for the surface consisting of all points that are equidistant from the point  $(-1, 0, 0)$  and the plane  $x = 1$ . Identify the surface.

$$d_1 = \sqrt{(x+1)^2 + y^2 + z^2} \quad d_2 = |x-1|$$

$$(x+1)^2 + y^2 + z^2 = (x-1)^2$$

$$y^2 + z^2 = -4x$$

$$\frac{y^2 + z^2}{-4} = x$$

$$z = -3 \quad (1, 2, 3)$$

equidist. b/w  $\curvearrowright$

$$d_1 = \sqrt{(x-1)^2 + (y-2)^2 + (z-3)^2}$$

$$d_2 = |z+3|$$

$$(x-1)^2 + (y-2)^2 + (z-3)^2 = (z+3)^2$$

$$(x-1)^2 + (y-2)^2 = 12z$$

$$z = \frac{(x-1)^2 + (y-2)^2}{12}$$