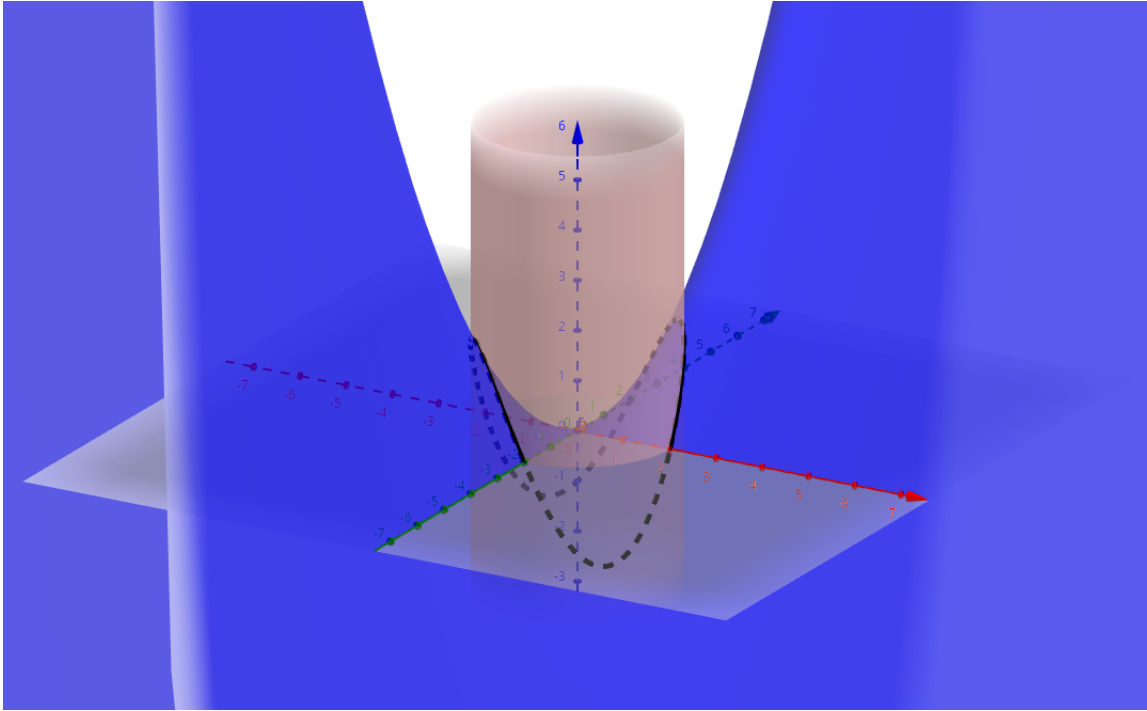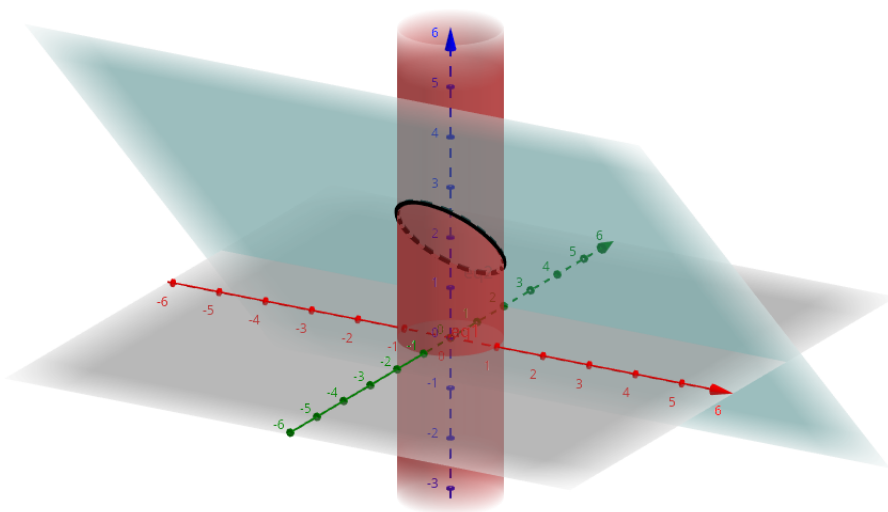1. $x^2 + y^2 = 4 \wedge z = x \cdot y$

$$r(t) = \begin{cases} x = 2\cos(t) \\ y = 2\sin(t) \\ z = 2\cos(t) \\ 0 \le t \le 2\pi \end{cases}$$

2. $x^2 + y^2 = 1 \wedge y + z = 2$

$$r(t) = \begin{cases} x = \cos(t) \\ y = \sin(t) \\ z = 2 - \sin(t) \\ 0 \le t \le 4\pi \end{cases}$$

3. $z = \sqrt{x^2 + y^2} \wedge z = 1 + y$

$\quad 1 + y = \sqrt{x^2 + y^2}$

$(1+y)^2 = |x^2 + y^2|$

$y^2 + 2y + 1 = |x^2 + y^2|$

$y^2 + 2y + 1 = x^2 + y^2$

$y = \frac{x^2 - 1}{2}$

$$r(t) = \begin{cases} x = t \\ y = \frac{t^2 - 1}{2} \\ z = \frac{t^2 - 1}{2} + 1 \end{cases}$$