

Outline

- Cylinders and quadric surfaces

Quadric surfaces are the graphs of any equation that can be put into the general form:

$$Ax^2 + By^2 + Cz^2 + Dxy + Exz + Fyz + Gx + Hy + Iz + J = 0 \quad (1)$$

where $A - J$ are constants.

Cylinders: A cylinder is a surface that is generated by moving a straight line along a given planar curve while holding the line parallel to a given fixed line.

Ex: Find an equation for the cylinder made by the line parallel to z -axis that pass through the parabola $y = x^2, z = 0$.

$$y = x^2 \quad (2)$$

- Ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$
- Elliptical cone $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{z^2}{c^2}$
- Hyperboloid of one sheet $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$