

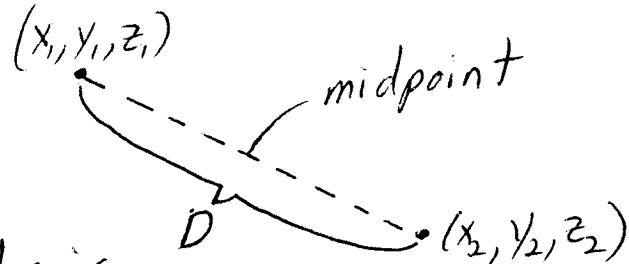
Math 16C
Vogler

3D Space

Defn Let (x_1, y_1, z_1) & (x_2, y_2, z_2) be two points in 3D.

- The midpoint of the line segment joining these points is

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}, \frac{z_1 + z_2}{2} \right)$$



- The distance between these points is

$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

Defn The set of all points (x, y, z) in 3D space which are a distance r from a fixed point (h, k, ℓ) is a sphere (with center (h, k, ℓ) & radius r) given by equation

$$(x - h)^2 + (y - k)^2 + (z - \ell)^2 = r^2$$

