

## 1-1 Videos Guide

### 1-1a

- Distance between two points in space
  - $d(P_1, P_2) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- Equation of a sphere with center  $(h, k, l)$  and radius  $r$ 
  - $(x - h)^2 + (y - k)^2 + (z - l)^2 = r^2$

### 1-1b

Exercises:

- Show that the equation represents a sphere, and find its center and radius.  
 $x^2 + y^2 + z^2 - 2x - 4y + 8z = 15$
- Find an equation of a sphere if one of its diameters has endpoints  $(5, 4, 3)$  and  $(1, 6, -9)$ .
- Describe in words the region of  $\mathbb{R}^3$  represented by the equation  $x^2 + y^2 = 4$ .