12.1 Videos Guide

12.1a

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

12.1b

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 $x^2 + y^2 = 4$.