MATH 243: SECTION 12.1 GROUPWORK

(1) Describe in words the region of $\mathbb{R}^3$ represented by the inequality

$$x^2 + z^2 < 16.$$

Sketch a picture of this region.

(2) Consider the triangle in space whose vertices are the three points

$$(0, 3, -2), \quad (-1, 2, 4), \quad (3, 3, -1).$$

Determine the lengths of the three sides of the triangle.

(3) Determine the center and radius of the sphere given by the equation

$$x^2 + y^2 + z^2 - 2x + 4y - 6z = 2.$$