

## MATH 251 – QUIZ 1 – SOLUTIONS

**Question:** (10 points)

Find the center and the radius of the following sphere:

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

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

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

$$(x - 2)^2 - 2^2 + (y + 1)^2 - 1^2 + (z + 3)^2 - 3^2 = 2$$

$$(x - 2)^2 + (y + 1)^2 + (z + 3)^2 = 2 + 4 + 1 + 9$$

$$(x - 2)^2 + (y + 1)^2 + (z + 3)^2 = 16$$

Therefore the center of the sphere is  $(2, -1, -3)$  and the radius is 4