Answer on Question #75371- Math – Differential Equations

Obtain the equation of the sphere having center on the line x/3= y/2= z/-5 and passing through the points (0,-2,-4) and (2,-1,-1).

**Solution**

Use the formula of the equation of the sphere:

where the center of the sphere, *R –* radius of the sphere.

As the sphere passing through the points (0,-2,-4) and (2,-1,-1) then the distance from the center to each of these points – radius of the sphere. Using the formula of the distance between two points we will find radius:

or (1)

let's equate the right parts:

Then

As the sphere having center on the line x/3= y/2= z/-5 then the point belongs to the line. Thus:

or

Let's substitute in (2):

Substitute in (3):

then the point (3,2,-5) the center of the sphere

Substitute in (1):

Thus the equation of our sphere is

**Answer:**