# Answer on Question #45094 – Math – Analytic Geometry

**Task:**

Find the centre and radius of the circle x^2 + y^2 + z^2 + 2x + 2y + 4z = 3, 2x - y - z = 3.

**Solution:**

The equation x^2 + y^2 + z^2 + 2x + 2y + 4z = 3 can be rewriten in the form

(x+1)^2+(y+1)^2+(z+2)^2=9. As we can see this is a sphere with centre at (-1,-1,-2) and radius 3.

Since the circle lies in the plane 2x - y - z = 3. Than the vector (2,-1,-1) is perpendicular the circle. The line that passes through the centre of the sphere and has directing vector (2,-1,-1) is (x+1)/2=(y+1)/(-1)=(z+2)/(-1). So, the centre of the circle is a point that is in the intersection of the line (x+1)/2=(y+1)/(-1)=(z+2)/(-1) and of the plane 2x-y-z=3.

Solving this we get a point x=1/4, y=-3/4, z=-7/4.

Also it can be easily seen that the point x=0, y=-3, z=0 belongs to the circle.

So the radius of the circle is the distance between points (0,-3,0) and (1/4, -3/4,-7/4) and it is equal to 1.92.

**Answer: 1.92 .**