

No calculators, cell phones, computers, notes, etc.

Circle your answer. Make your work correct, complete and coherent.

The quiz is worth 5 points. The solutions will be posted on my website later today.

Quiz 1, August 30, 2018

Find the center and radius of the sphere $2x^2 + 2y^2 + 2z^2 + x + y + z = 9$.

ANSWER: Complete the square. The original equation has the same solutions as

$$2\left(x^2 + \frac{1}{2}x + \frac{1}{16}\right) + 2\left(y^2 + \frac{1}{2}y + \frac{1}{16}\right) + 2\left(z^2 + \frac{1}{2}z + \frac{1}{16}\right) = 9 + 2\frac{1}{16} + 2\frac{1}{16} + 2\frac{1}{16}.$$

$$2\left(x + \frac{1}{4}\right)^2 + 2\left(y + \frac{1}{4}\right)^2 + 2\left(z + \frac{1}{4}\right)^2 = 9 + \frac{3}{8}$$

$$\left(x + \frac{1}{4}\right)^2 + \left(y + \frac{1}{4}\right)^2 + \left(z + \frac{1}{4}\right)^2 = \frac{75}{16}$$

The sphere has center $\left(-\frac{1}{4}, -\frac{1}{4}, -\frac{1}{4}\right)$ and radius $\frac{\sqrt{75}}{4}$.