

Please PRINT your name \_\_\_\_\_

**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, January 20, 2021**

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  $\frac{\sqrt{75}}{4}$ .