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 2, August 31, 2020

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

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

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

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

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