

USING A 3-D COORDINATE SYSTEM

①

midpoint of AB

$$\left(\frac{2+4}{2}, \frac{-5+3}{2}, \frac{8-6}{2} \right) = (3, -1, 1)$$

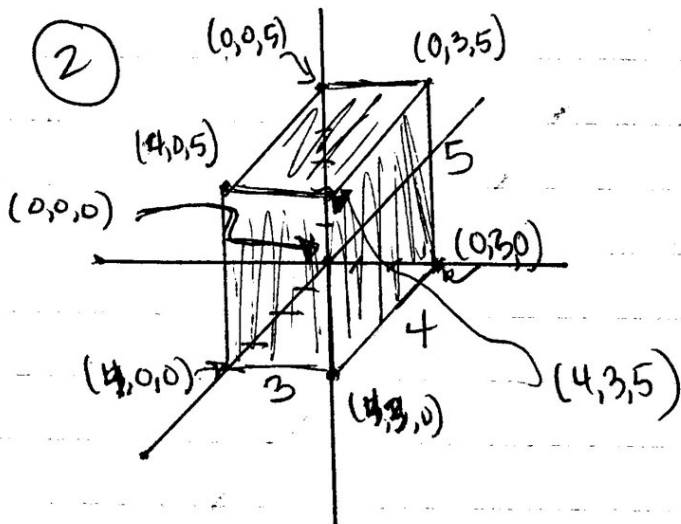
this is center of sphere :)

need radius.

$$\begin{aligned} \text{diameter} &= \sqrt{2^2 + 8^2 + 14^2} \\ &= \sqrt{4 + 64 + 196} \\ &= \sqrt{264} \end{aligned}$$

$$\text{radius} = \frac{1}{2} \sqrt{264} \text{ or } \sqrt{\left(\frac{264}{4}\right)} = \sqrt{66}$$

$$(x-3)^2 + (y+1)^2 + (z-1)^2 = 66$$



3. If $(x - 4)^2 + (y + 5)^2 = 36$ is a great circle of a sphere lying on the xy plane,

A. Write the equation of the sphere.

$$(x - 4)^2 + (y + 5)^2 + z^2 = 36$$

$(4, -5, 0)$ center

B. Write the equation of the sphere if the center is translated by the image formula $(x + 4, y - 6, z + 8)$

$(8, -11, 8)$ new center

$$(x - 8)^2 + (y + 11)^2 + (z - 8)^2 = 36$$

4. Find the length of the median segment in triangle ABC from B to segment AC if

A(4, -5, 7) B(-2, 0, 8) C(6, -3, 4)

mid pt \overline{AC} $(5, -4, 5.5)$

$$\begin{aligned} \text{median} &= \sqrt{7^2 + 4^2 + 2.5^2} \\ &= \sqrt{71.25} \quad \text{UNITS} \end{aligned}$$