NAME____________________________________________

Find an equation of the sphere that passes through the point \((2, -1, 0)\) and has center \((-4, 2, -4)\).

You must show and explain (in words) your procedure in doing this in order to receive credit. You will not receive credit if you just write down a final answer.

**Solution:** The square of the radius of this sphere is

\[
r^2 = (2 - (-4))^2 + (-1 - 2)^2 + (0 - (-4))^2 = 61.
\]

Since a sphere of radius \(r\) with center at \((a, b, c)\) has equation

\[
(x - a)^2 + (y - b)^2 + (z - c)^2 = r^2,
\]

we see that the indicated sphere has equation

\[
(x + 4)^2 + (y - 2)^2 + (z + 4)^2 = 61.
\]