Special Problem 2-4.15

The location of some point P_a is denoted with position vector $\bar{r}_a$.

The location of some other point P_b is denoted with position vector $\bar{r}_b$.

We know that $\bar{r}_a - \bar{r}_b = \hat{a}_y + 6\,\hat{a}_z$.

We likewise know that the coordinates of point P_a are:

$$\rho_a = \sqrt{8} \qquad \phi_a = 225^\circ \qquad z_a = 0$$

Determine the distance between point P_b and the origin.