

21-S-2-7-AG-053

When working on anything located under the hood of your car, it is important to support the weight of the hood so that it does not crush you. Most cars accomplish this by providing a small stand that the user puts up. Given $d_1 = W \text{ m}$, $d_2 = X \text{ m}$, $d_3 = Y \text{ m}$, and $d_4 = Z \text{ m}$, what is the position vector of point B relative to point A?

ANSWER:

We know that a position vector in Cartesian form can be expressed by,

$$\mathbf{r} = (x_B - x_A)\hat{\mathbf{i}} + (y_B - y_A)\hat{\mathbf{j}} + (z_B - z_A)\hat{\mathbf{k}}$$

To find the position vector of point B relative to point A, we simply insert our known values into the above equation.

$$\mathbf{r} = (Z - X)\hat{\mathbf{i}} + (Y - 0)\hat{\mathbf{j}} + (W - 0)\hat{\mathbf{k}} = (Z - X)\hat{\mathbf{i}} + (Y)\hat{\mathbf{j}} + (W)\hat{\mathbf{k}}$$