# 6.1 Vector Coordinates

**550.** Unit Vectors

$\vec{i} = (1, 0, 0)$,

$\vec{j} = (0, 1, 0)$,

$\vec{k} = (0, 0, 1)$,

$|\vec{i}| = |\vec{j}| = |\vec{k}| = 1$.

**551.** $\vec{r} = \vec{AB} = (x_1 - x_0)\vec{i} + (y_1 - y_0)\vec{j} + (z_1 - z_0)\vec{k}$

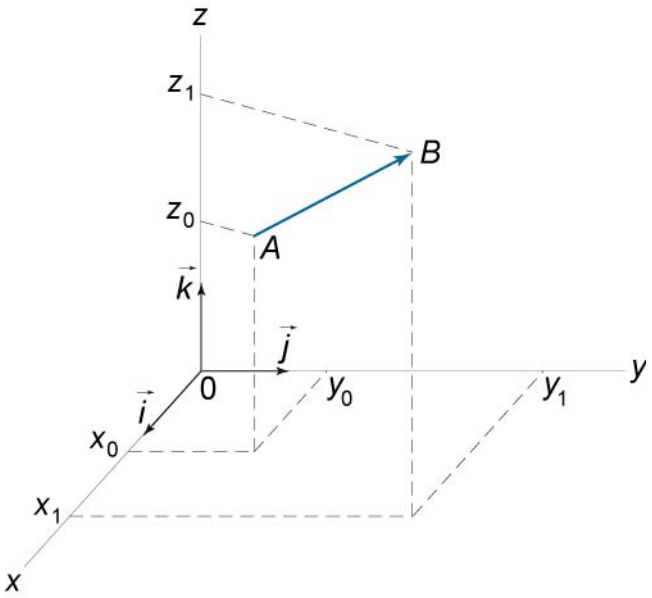


**Figure 73.**

**552.** $|\vec{r}| = |\vec{AB}| = \sqrt{(x_1 - x_0)^2 + (y_1 - y_0)^2 + (z_1 - z_0)^2}$

**553.** If $\vec{AB} = \vec{r}$, then $\vec{BA} = -\vec{r}$.

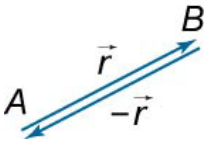


**Figure 74.**

**554.** $X = |\vec{r}| \cos\alpha$,
$Y = |\vec{r}| \cos\beta$,
$Z = |\vec{r}| \cos\gamma$.

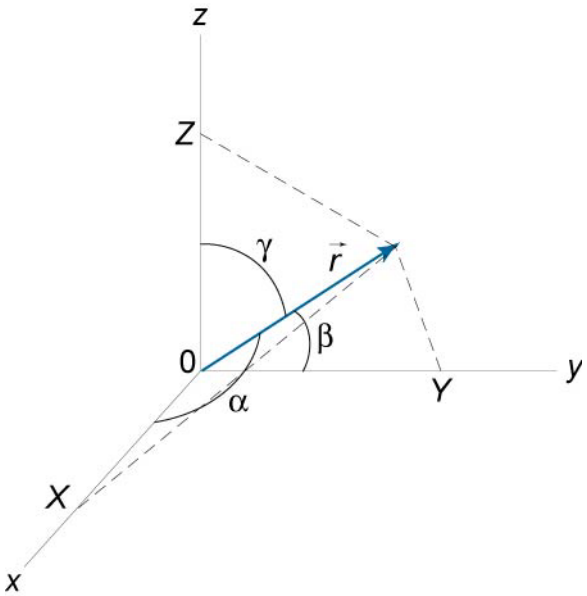


**Figure 75.**

**555.** If $\vec{r}(X, Y, Z) = \vec{r}_1(X_1, Y_1, Z_1)$, then
$X = X_1$, $Y = Y_1$ , $Z = Z_1$.