

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

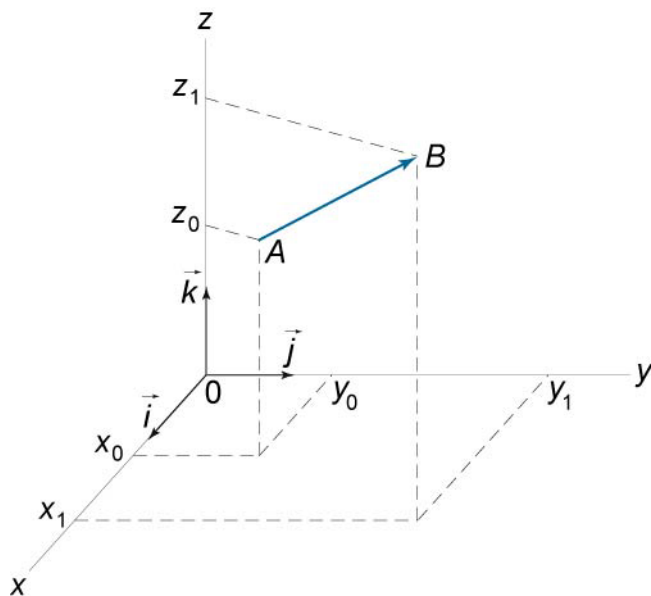


Figure 73.

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 $\vec{BA} = -\vec{r}$.

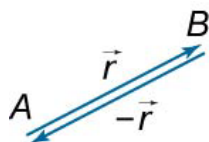


Figure 74.

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

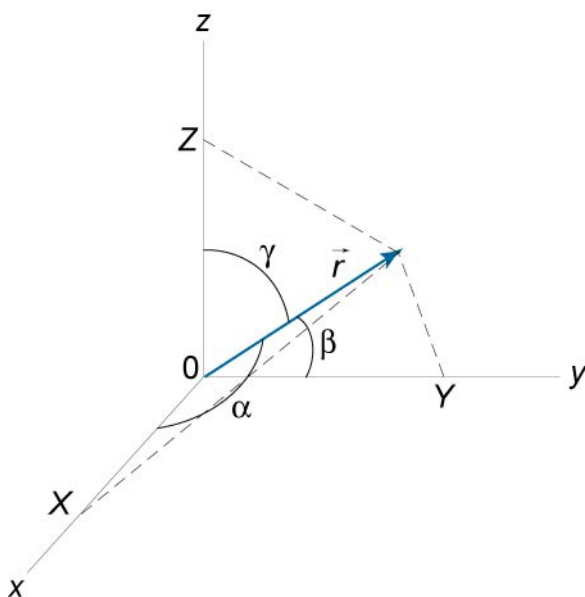


Figure 75.

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