Exercise 1.40

In each case, find the x- and y-components of vector $\vec{\boldsymbol{A}}$: (a) $\vec{\boldsymbol{A}} = 5.0\hat{\boldsymbol{i}} - 6.3\hat{\boldsymbol{j}}$; (b) $\vec{\boldsymbol{A}} = 11.2\hat{\boldsymbol{j}} - 9.91\hat{\boldsymbol{i}}$; (c) $\vec{\boldsymbol{A}} = -15.0\hat{\boldsymbol{i}} + 22.4\hat{\boldsymbol{j}}$; (d) $\vec{\boldsymbol{A}} = 5.0\vec{\boldsymbol{B}}$, where $\vec{\boldsymbol{B}} = 4\hat{\boldsymbol{i}} - 6\hat{\boldsymbol{j}}$.

Solution

The number multiplying $\hat{\boldsymbol{i}}$ is the x-component, and the number multiplying $\hat{\boldsymbol{j}}$ is the y-component.

(a) $\vec{\boldsymbol{A}} = 5.0\hat{\boldsymbol{i}} - 6.3\hat{\boldsymbol{j}} = \langle 5.0, -6.3 \rangle \quad \Rightarrow \quad \begin{cases} A_x = 5.0 \\ A_y = -6.3 \end{cases}$

(b) $\vec{\boldsymbol{A}} = 11.2\hat{\boldsymbol{j}} - 9.91\hat{\boldsymbol{i}} = \langle -9.91, 11.2 \rangle \quad \Rightarrow \quad \begin{cases} A_x = -9.91 \\ A_y = 11.2 \end{cases}$

(c) $\vec{\boldsymbol{A}} = -15.0\hat{\boldsymbol{i}} + 22.4\hat{\boldsymbol{j}} = \langle -15.0, 22.4 \rangle \quad \Rightarrow \quad \begin{cases} A_x = -15.0 \\ A_y = 22.4 \end{cases}$

(d) $\vec{\boldsymbol{A}} = 5.0\vec{\boldsymbol{B}} = 5.0(4\hat{\boldsymbol{i}} - 6\hat{\boldsymbol{j}}) = 20\hat{\boldsymbol{i}} - 30\hat{\boldsymbol{j}} \quad \Rightarrow \quad \begin{cases} A_x = 20 \\ A_y = -30 \end{cases}$