Exercise 1.41

Write each vector in Fig. E1.28 in terms of the unit vectors $\hat{\boldsymbol{i}}$ and $\hat{\boldsymbol{j}}$.

Solution

Figure **E1.28**
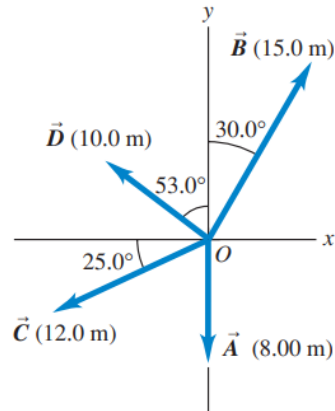
Use the figure to write each of the vectors in terms of its components along the x- and y-axes.

$$\mathbf{A} = \langle A_x, A_y \rangle = \langle 0, -8.00 \rangle = (-8.00 \text{ m})\hat{\boldsymbol{j}}$$

$$\mathbf{B} = \langle B_x, B_y \rangle = \langle 15.0 \sin 30°, 15.0 \cos 30° \rangle \approx \langle 7.50, 13.0 \rangle = (7.50 \text{ m})\hat{\boldsymbol{i}} + (13.0 \text{ m})\hat{\boldsymbol{j}}$$

$$\mathbf{C} = \langle C_x, C_y \rangle = \langle -12.0 \cos 25°, -12.0 \sin 25° \rangle \approx \langle -10.9, -5.07 \rangle = (-10.9 \text{ m})\hat{\boldsymbol{i}} + (-5.07 \text{ m})\hat{\boldsymbol{j}}$$

$$\mathbf{D} = \langle D_x, D_y \rangle = \langle -10.0 \sin 53°, 10.0 \cos 53° \rangle \approx \langle -7.99, 6.02 \rangle = (-7.99 \text{ m})\hat{\boldsymbol{i}} + (6.02 \text{ m})\hat{\boldsymbol{j}}$$