Position vector $\mathbf{r}$
Write the vector $\mathbf{r}_{AB}$ in Cartesian vector notation:

Write the force vector $\mathbf{F}$ in Cartesian vector notation:
Section 2.8 Force vector directed along a line

Problem 1 (Reference 3D Model)
**Given**: A person is positioned as shown below. He pulls the cable with a force of 70 lb.
**Required**: Write this force in terms of a vector.

**Solution**: 

Approach:

Step 1: Determine the position vector \( \mathbf{r}_{AB} \)

Step 2: Determine the unit vector of this position vector

\[
\mathbf{u}_{AB} = \frac{\mathbf{r}_{AB}}{r}
\]

Step 3: Multiply the magnitude of this force to the vector \( \mathbf{u}_{AB} \)

\[
\mathbf{F}_{AB} = F \mathbf{u}_{AB}
\]
Problem 2-86. Determine the position vector $\mathbf{r}$ directed from point $A$ to point $B$ and the length of cord $AB$. Take $z = 4$ m.
Problem 2-101. The cable $AO$ exerts a force on the top of the pole of $F = \{-120i - 90j - 80k\}$ lb. If the cable has a length of 34 ft, determine the height $z$ of the pole and the location $(x,y)$ of its base.
**TEAM PROBLEM**

**F2–22.** Express the force as a Cartesian vector.

![Diagram showing vectors and forces](image)

Step 1: Determine the position vector \( \mathbf{r}_{AB} \).

Step 2: Determine the unit vector, \( \mathbf{u}_{AB} \), of the position vector \( \mathbf{r}_{AB} \).

Step 3: Multiply the magnitude of this force to the vector \( \mathbf{u}_{AB} \): \( F_{AB} = F \mathbf{u}_{AB} \)