

Example: A hockey player is standing on his skates on a frozen pond when an opposing player, moving with a uniform speed of 12 m/s , skates by with the puck. After 3 s , the first player makes up his mind to chase his opponent. If he accelerates uniformly at 4 m/s^2 , how long does it take him to catch his opponent?

Note: Assume the player with the puck remains in motion at constant speed.

$$\begin{array}{l} \text{Answer} \\ \hline t = 8.2 \text{ s} \end{array}$$

Chapter 3

Vectors and Two-Dim. Motion

A vector has both magnitude and direction.

In the textbook, boldface letters are used to represent a vector quantity.

In the notes, vector quantities will be represented as

$$\vec{A}, \vec{B}, \vec{C}$$

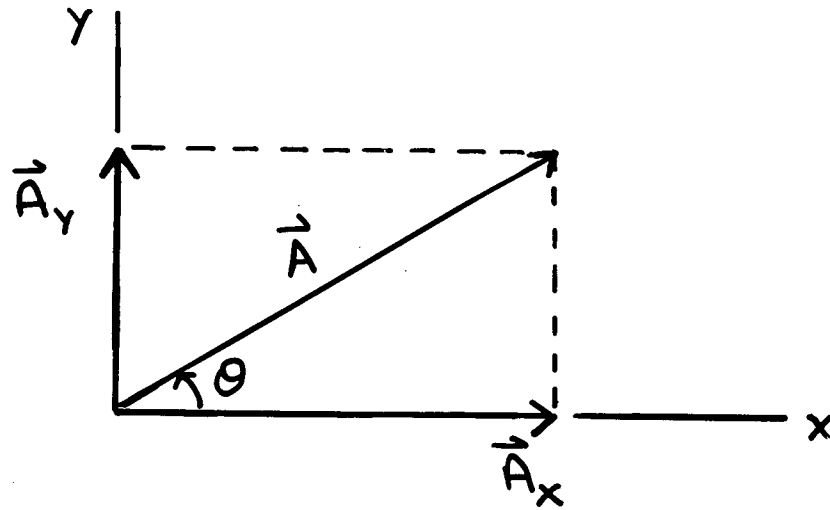
The magnitude of a vector will then be written as

$$|\vec{A}| = A$$

Properties of Vectors

1. Addition (graphing or component)
2. Subtraction
3. Multiplication
4. Multiplication or division by a scalar.

Component Addition of Vectors



Consider a vector $\vec{A}$ lying in the xy plane and making an angle θ with the positive x axis.

This vector can be expressed as the sum of two other vectors $\vec{A}_x$ and $\vec{A}_y$, where

$\vec{A}_x$ is the component of $\vec{A}$ parallel to the x-axis

$\vec{A}_y$ is the component of $\vec{A}$ parallel to the y-axis.

These components can be either positive or negative