Preview

Objectives

- **Distinguish** between a scalar and a vector.
- **Add** and **subtract** vectors by using the graphical method.
- **Multiply** and **divide** vectors by scalars.

End Of Slide

Scalars and Vectors

- A **scalar** is a physical quantity that has magnitude but no direction.
  - **Examples:** speed, volume, the number of pages in your textbook
- A **vector** is a physical quantity that has both magnitude and direction.
  - **Examples:** displacement, velocity, acceleration
- In this book, scalar quantities are in *italics*. Vectors are represented by **boldface** symbols.

End Of Slide

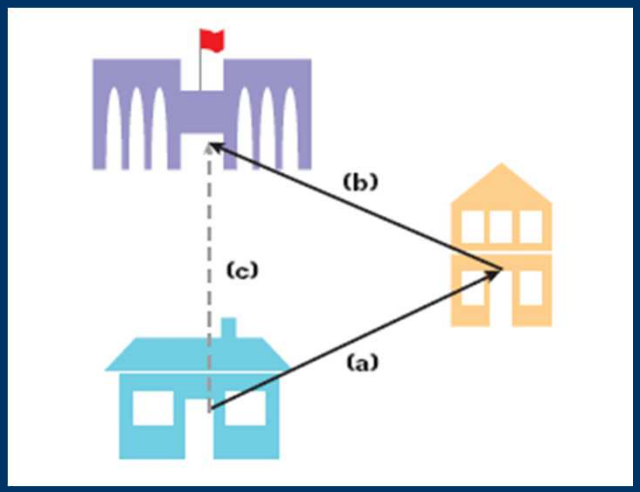
Scalars and Vectors

Click below to watch the Visual Concept.

Visual Concept

Graphical Addition of Vectors

- A **resultant vector** represents the sum of two or more vectors.
- Vectors can be added **graphically.**



*A student walks from his house to his friend's house **(a)**, then from his friend's house to the school **(b)**. The student's resultant displacement **(c)** can be found by using a ruler and a protractor.*

End Of Slide

Triangle Method of Addition

- Vectors can be moved **parallel** to themselves in a diagram.
- Thus, you can draw one vector with its **tail** starting at the **tip** of the other as long as the size and direction of each vector do not change.
- The **resultant vector** can then be drawn from the tail of the first vector to the tip of the last vector.

End Of Slide

Triangle Method of Addition

Click below to watch the Visual Concept.

Visual Concept

Properties of Vectors

- Vectors can be added in **any order**.
- To **subtract** a vector, add its opposite.
- **Multiplying** or **dividing** vectors by scalars results in vectors.

End Of Slide

Properties of Vectors

Click below to watch the Visual Concept.

Visual Concept

Subtraction of Vectors

Click below to watch the Visual Concept.

Visual Concept

Multiplication of a Vector by a Scalar

Click below to watch the Visual Concept.

Visual Concept