

1-8 Graphs and Functions (Pages 43–48)

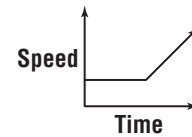
A **function** is a relationship between input and output. In a function, the output depends on the input. There is exactly one output for each input. For example, vegetables are often sold by the pound. So, the weight of a vegetable would be the input and the total price would be the output. In this example, the price you pay depends on the weight of the vegetables. The weight of the vegetables that you purchase is the **independent variable** or **quantity**. The price you pay for the vegetables is the **dependent variable** or **quantity**. On a graph, the independent variable is usually graphed on the **horizontal axis**, and the dependent variable is graphed on the **vertical axis**. **Ordered pairs** are used to locate points on the graph. The ordered pair (0, 0) corresponds to the **origin**. A **relation** is a set of ordered pairs. The set of first numbers in the ordered pair is the **domain** of the relation, while the set of second numbers is the **range**.

Example

Marco rides his bike to school every morning. For a certain time, he rides at a steady rate. When he gets near the school, he must ride down a steep hill that causes him to pick up speed. What are the independent and dependent quantities? What would a graph of this situation look like?

Time is the independent quantity. Marco's speed is the dependent quantity because it depends on the time.

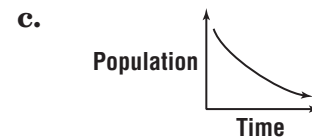
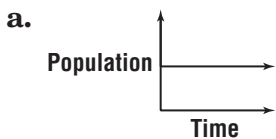
This graph shows that Marco's speed remains constant for most of the time when he rides to school, but increases near the end of his ride when he goes down the hill.



Practice

Identify the graph that matches the statement. Explain your answer.

1. The population of humans on Earth is increasing faster and faster each year.



2. **Standardized Test Practice** On a summer day, when the temperature in Marjorie's apartment rises to 80°F, the air conditioner comes on and cools the apartment to 76°F. The air conditioner then switches off and stays off until the temperature rises to 80°F again. Then the cycle repeats. Which graph represents this situation?

