SKETCHING FUNCTIONS II
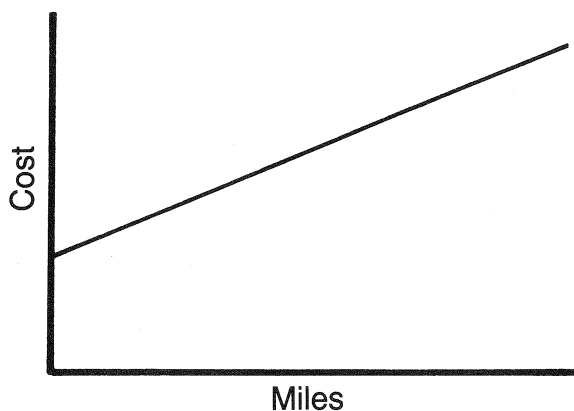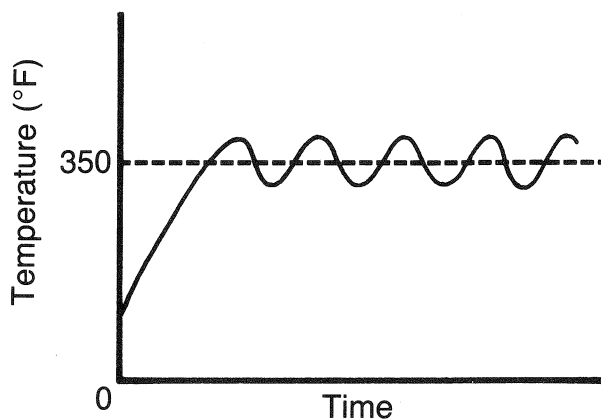
Study each function below and then answer the questions at the bottom of the page.
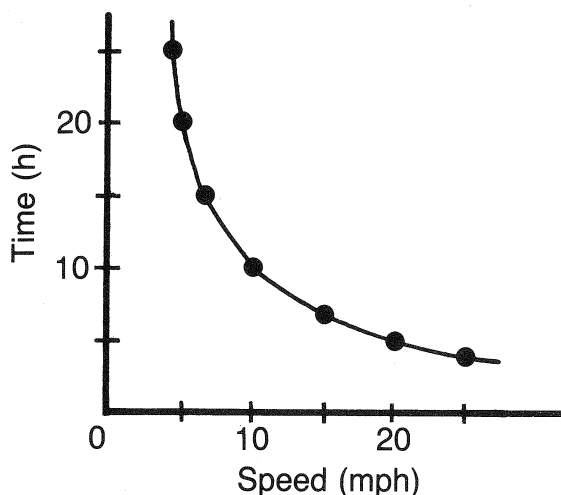
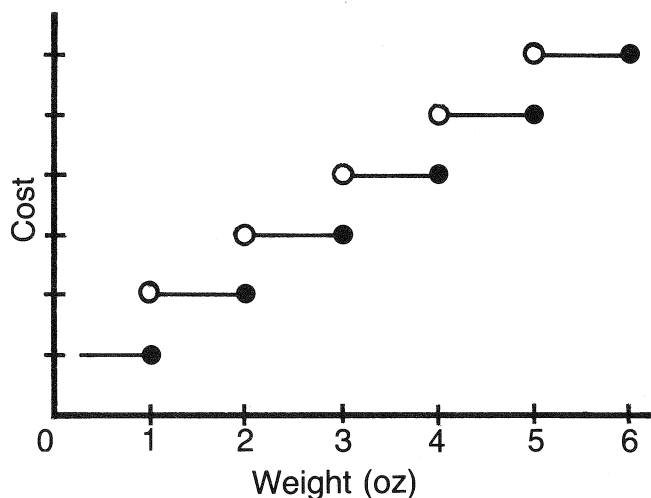A. The cost per month of owning a car is a function of the number of miles driven.

B. The temperature in an oven set at 350°F is a function of the time since it was turned on.

C. The time it takes to ride a bicycle 100 miles is a function of the average speed.

D. The cost of postage for a first-class letter is a function of its weight in ounces.

GRAPH A: When the number of miles driven equals 0, why is the cost per month not equal to 0? Why does the graph have a positive slope?

GRAPH B: When time equals 0, why is the temperature in the oven not equal to 0? Why does the temperature eventually oscillate around 350°F?

GRAPH C: How long does it take to ride a bicycle 100 miles at each of the following speeds: 5 mph, 10 mph, 15 mph, 20 mph, 25 mph? What is always true about the product *speed* × *time*?

GRAPH D: Why does the graph look like a series of steps rather than a smooth curve? Why is a hollow circle needed at the beginning of each step (except the first)?

D–10   OBJECTIVE 1–c: To describe how real-world functional relationships can be represented by graphs, using concepts such as slope, domain, range, and initial conditions.
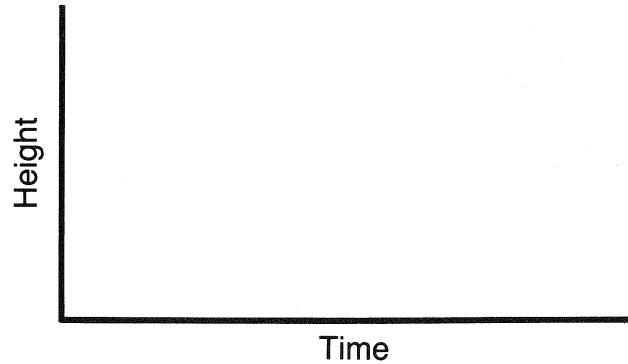
SKETCHING FUNCTIONS III

Make a sketch for each function described below. Use your knowledge of the relationships described.
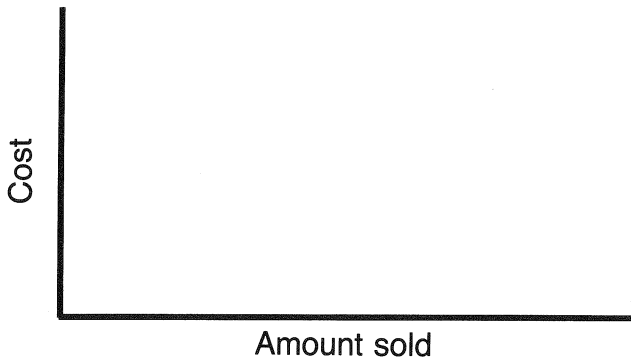
(A) At a fixed price per ounce, the cost of buying gold is a function of the number of ounces you buy.

Cost | Number of ounces
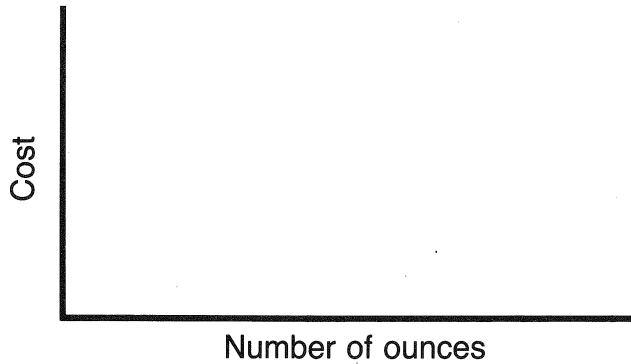
(B) The height of your head above the ground as you ride a Ferris wheel is a function of the time since you got on.

Height | Time
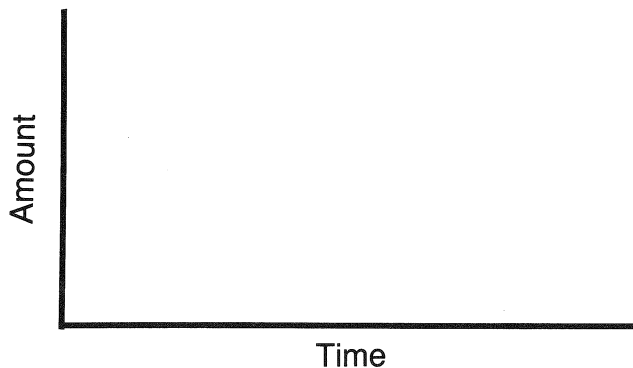
(C) The total cost of operating a lemonade stand is a function of the amount of lemonade sold.

Cost | Amount sold

(D) The profit from operating a lemonade stand is a function of the amount of lemonade sold.

Profit | 0 | Amount sold
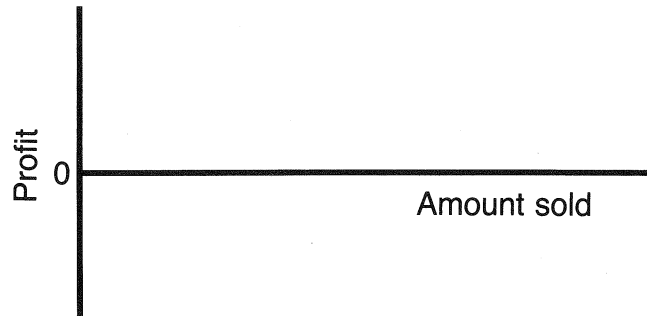
(E) The amount of water in a pan on a burner that is turned on "high" is a function of the time since the burner was turned on.

Amount | Time

(F) The height of a ball that is dropped from a height of 10 feet is a function of the time since it was dropped.

10 | Height (ft) | Time

OBJECTIVE 1–d: To sketch the graph of a function using knowledge of real-world relationships.

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