# Input and Output

Chapter 2

Section 1

# Finding Output Values – House Painting Example

In the house painting example from section 1.1, the notation $n = f(A)$ indicates that $n$ is a function of $A$. The expression $f(A)$ represents the output of the function – specifically, the amount of paint required to cover an area of $A$ $ft^2$.

- Use the fact that 1 gallon of paint covers 250 $ft^2$, to evaluate the expression $f(20{,}000)$.

# Evaluating a Function Using a Formula

The formula for the area of a circle of radius $r$ is $A = q(r) = \pi r^2$. Use the formula to evaluate $q(10)$ and $q(20)$. What do your results tell you about circles? (Interpret your results)

# More Function Evaluations

For each of the functions listed below, evaluate and simplify the given expressions:

$$g(x) = \frac{x^2 + 1}{5 + x}$$

$a)\ g(3)$

$b)\ g(-1)$

$c)\ g(a)$

$$h(x) = x^2 - 3x + 5$$

$a)\ h(2)$

$b)\ h(a-2)$

$c)\ h(a) - 2$

$d)\ h(a) - h(2)$

# Finding Input Values: Solving Equations

Use the cricket function $T = \frac{1}{4} R + 40$, introduced in section 1.1, to find the rate, $R$, at which the snowy tree cricket chirps when the temperature, $T$, is 76°F.

# More Solving Equations

$$f(x) = \frac{1}{\sqrt{x-4}}$$

a) Find an $x$-value that results in $f(x) = 2$.
b) Is there an $x$-value that results in $f(x) = -2$?

# More Solving Equations

Let $A = q(r) = \pi r^2$ be the area of a circle of radius $r$, where $r$ is in cm. What is the radius of a circle whose area is 100 $cm^2$?

# Finding Output and Input from Tables

The table below shows the revenue, $R = f(t)$, received or expected by the National Football League, NFL, from network TV as a function of the year, $t$, since 1975.

a) Evaluate and interpret $f(25)$.

b) Solve and interpret $f(t) = 1159$.

| Year, $t$(since 1975 | 0 | 5 | 10 | 15 | 20 | 25 | 30 |
|---|---|---|---|---|---|---|---|
| Revenue, $R$(million \$) | 201 | 364 | 651 | 1075 | 1159 | 2200 | 2200 |

# Finding Output and Input from Graphs

A man drives from his home to a store and back. The entire trip takes 30 minutes. The graph on the next slide gives his velocity $v(t)$ (in mph) as a function of the time $t$ (in minutes) since he left home. A negative velocity indicates that he is traveling away from the store back to his home.

# Finding Output and Input from Graphs

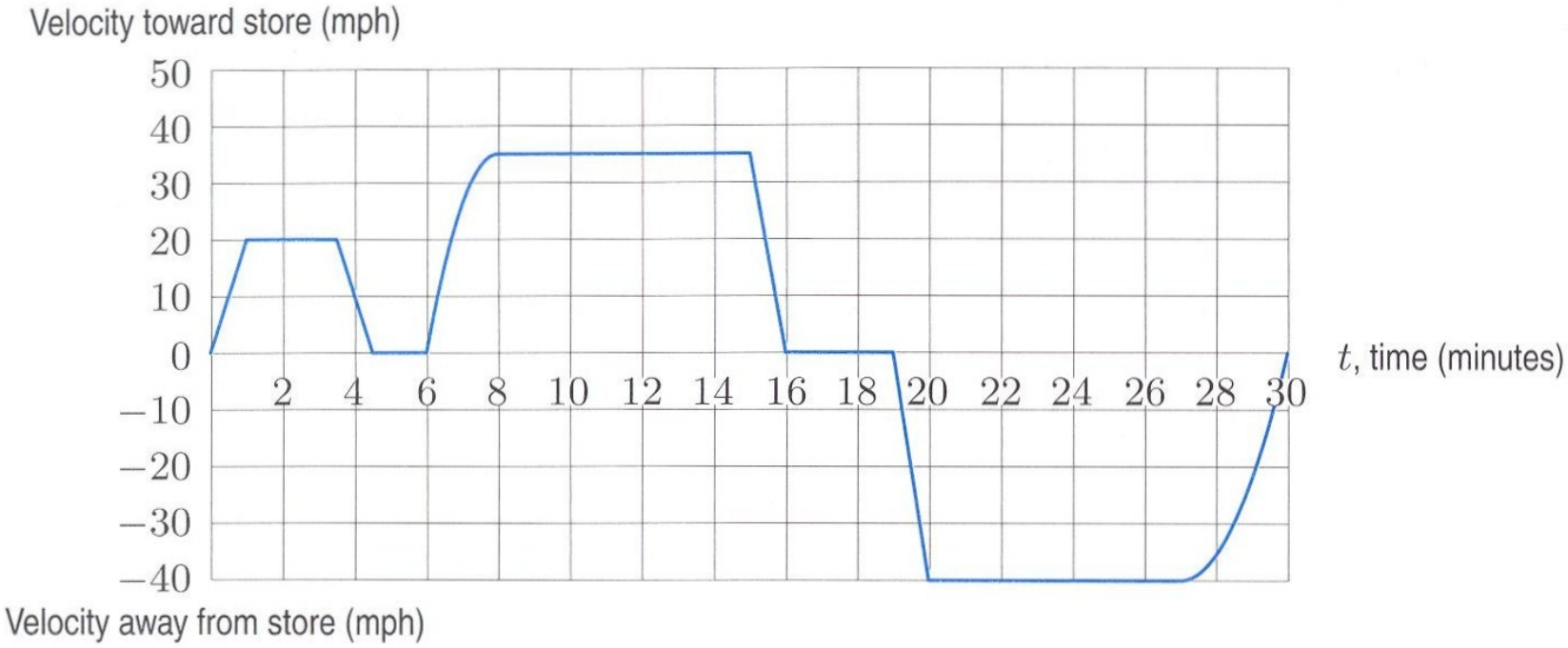


**Figure 2.1:** Velocity of a man on a trip to the store and back

Evaluate and interpret:

a) $v(5)$ b) $v(24)$ c) $v(8) - v(16)$ d) $v(-3)$

# Finding Output and Input from Graphs

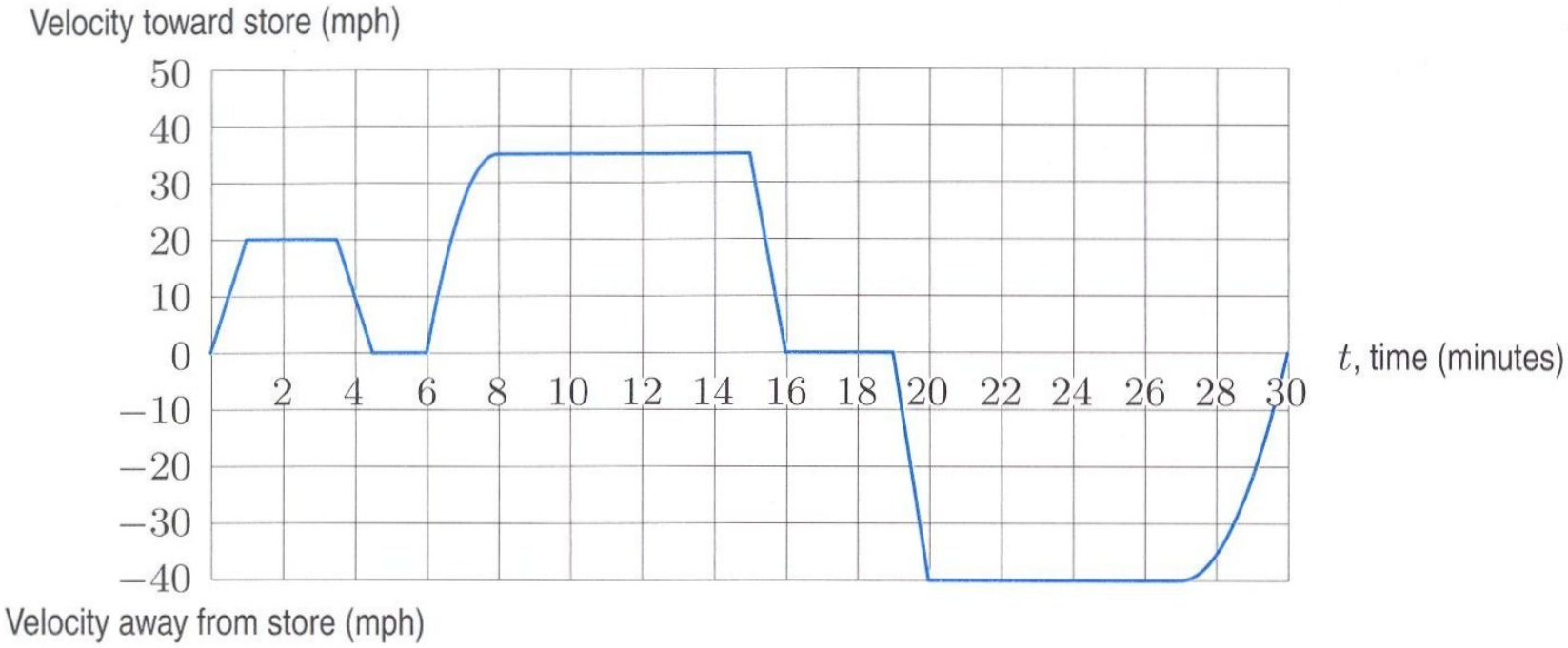


**Figure 2.1:** Velocity of a man on a trip to the store and back

Solve for *t* and interpret:

e) $v(t) = 15$  f) $v(t) = -20$  g) $v(t) = v(7)$