

## Section 2.1: Input and Output

1. Let  $h(x) = x^2 - 3x + 5$ . Evaluate and simplify the following expressions.

(a)  $h(2)$

(b)  $h(a - 2)$

(c)  $h(a) - 2$

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

2. If  $h(x) = ax^2 + bx + c$ , find  $h(0)$ .

3. Let  $f(t) = t^2 - 4$ .

(a) Find  $f(0)$ .

(b) Solve  $f(t) = 0$ .

(c) Solve  $f(t) = -2$ .

4. Table 2.4 shows  $N(s)$ , the number of sections of Economics 101, as a function of  $s$ , the number of students in the course. If  $s$  is between two numbers listed in the table, then  $N(s)$  is the higher number of sections.

**Table 2.4**

$s$	50	75	100	125	150	175	200
$N(s)$	4	4	5	5	6	6	7

(a) Evaluate and interpret:

i.  $N(150)$

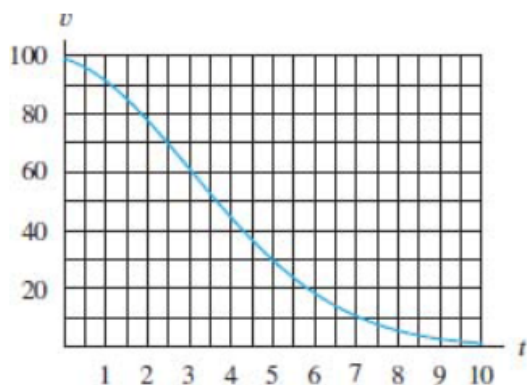
ii.  $N(80)$

(b) Solve for  $s$  and interpret:

i.  $N(s) = 7$

ii.  $N(s) = 4$

5. Let  $v = f(t)$  be the speed of a braking car, in feet per second,  $t$  seconds after the brakes are first applied. A graph of  $f$  is given in Figure 2.6.



**Figure 2.6**

Use Figure 2.6 to complete the following:

- Evaluate  $f(1)$ . Explain the meaning of your answer in terms of the car.
  - Evaluate  $f(7) - f(5)$ . Explain the meaning of your answer in terms of the car.
  - Solve for  $f(t) = 60$ . Explain the meaning of your answer in terms of the car.
6. Let  $f(x) = x^2 + 2x - 2$  and  $g(x) = 2x + 2$ .
- Sketch a graph of  $g(x)$ .
  - Find the value(s) of  $x$  such that  $g(x) = 2$ . Describe how you can find this value both algebraically and graphically.
  - Using your graph from part (a), find all values of  $x$  such that  $g(x) < 2$ . How can you use the graph to find these values? How can you find these values algebraically? Demonstrate both methods in your notebook.
  - Sketch a graph of  $f(x)$ .
  - Using your graph from part (d), find all values of  $x$  such that  $f(x) < 1$ . How can you use the graph to find these values? How can you find these values algebraically? Demonstrate both methods in your notebook.
  - Sketch a graph of  $f(x)$  and  $g(x)$  on the same axis.
  - Using your graph from part (f), find all values of  $x$  such that  $f(x) < g(x)$ . How can you use the graph to find these values? How can you find these values algebraically? Demonstrate both methods in your notebook.

7. The profit, in dollars, made by a theater when  $n$  tickets are sold is  $P(n) = 20n - 500$ .
- (a) Calculate  $P(0)$ , and explain what this number means for the theater.
  - (b) Under what circumstances will the profit equal 0?
  - (c) What is the meaning of the quantity  $P(100)$ ? What are its units?