Exercises for Section 2.3  Self-Check

1. What are the two parts of a Pascal program?
2. Why shouldn’t you use a standard identifier as the name of a memory cell in a program? Can you use a reserved word instead?
3. Which of the following identifiers are (a) Pascal reserved words, (b) standard identifiers, (c) valid identifiers, and (d) invalid identifiers?
   end   ReadLn   8111   program   Sue’s
   Rate   Start   begin   const   XYZ123
   1231Y2   ThisIsALongOne   Y-Z   Program   'MaxScores'

Exercises for Section 2.4  Self-Check

1. a. Write the following numbers in normal decimal notation:
   103E-4   1.2345E+6   123.45E+3
   b. Write the following numbers in Pascal scientific notation:
   1300   123.45   0.00426
2. Indicate which of the following literal values are legal in Pascal and which are not. Identify the data type of each valid literal value.
   15   ‘XYZ’   ‘*’   $25.123   15. -999   .123   ‘x’
   ‘1’   ‘9’   ‘S’   True   ‘True’
3. Why should the value of pi (3.14159) be stored in a constant?
4. What would be the best variable type for the area of a circle in square inches? How about the number of cars passing through an intersection in an hour? Your name? The first letter of your last name?

Programming

1. Write the program heading and declarations for a program named Hine that has the constant HyPi (3.14159), variables Radius, Area, and Circum defined as Real, variable NumCirc as an Integer, and variable CircleName as a String.
Exercises for Section 2.5  Self-Check

1. Show the output displayed by the following program lines when the
data entered are 5 and 7:

```
WriteLn ('Enter two integers:');
ReadLn (M, N);  (*data line is: 5 7*)
M := M + 5;
N := 3 + M;
WriteLn ('M = ', M);
WriteLn ('N = ', N);
```

2. Show the output displayed by the following lines:

```
Write ('My name is:');
WriteLn ('Doe, Jane');
WriteLn;
Write ('I live in:');
Write ('Ann Arbor, MI:');
WriteLn ('and my zip code is ', 48109)
```

3. Indicate whether each of the following assignments is valid or invalid and
indicate the result of each valid assignment. Assume R is type Real, I is
type Integer, B is type Boolean, C is type Char, and S is type string.

   a. R := 3.5 + 5.0   f. S := C
   b. I := 2 * 5       g. C := S
   c. C := 'My name'   h. R := I
   d. S := 'Your name' i. I := R
   e. B := Boolean     j. R := 10 + 1
Exercises for Section 2.7  Self-Check

2. Given the declarations

```pascal
const
MyPi = 3.14159;
MaxI = 1000;

var
X, Y : Real;
A, B, I : Integer;
```

indicate which statements are valid and find the value of each valid statement. Also indicate which statements are invalid and explain why. Assume that A is 3, B is 4, and Y is 1.0.

- a. `I := A mod B`
- b. `I := (990 - MaxI) div A`
- c. `I := A mod Y`
- d. `I := MyPi * Y`
- e. `I := A / B`
- f. `I := A / B`
- g. `I := A mod (A / B)`
- h. `I := B div 0`
- i. `I := A mod (990 - MaxI)`

4. Write an assignment statement to implement the following equation in Pascal:

\[ q = \frac{A(M - T_2)}{2} \]

6. Let A, B, C, and X be the names of four type Real variables, and let I, J, and K be the names of three type Integer variables. Each of the following statements contains a violation of the rules for forming arithmetic expressions. Rewrite each statement so it is consistent with the rules.

- a. `X := 4.0 A * C`
- b. `A := AC`
- c. `I := 2 * -J`
- d. `K := 3(I + J)`
- e. `X := 5A / BC`
- f. `I := 5J3`
Exercises for Section 2.8  Self-Check

3. What is the output of the following sequence of program statements assuming I is an integer? Use the symbol □ to denote a blank space.

```
I := 1;
WriteLn (I : 5, ' ', I :1, I : 5);
I := I * 10;
WriteLn (I : 5, ' ', I :1, I : 5);
I := I * 10;
WriteLn (I : 5, ' ', I :1, I : 5);
I := I * 10;
WriteLn (I : 5, ' ', I :1, I : 5)
```

4. Assuming X (type Real) is 12.335 and I (type Integer) is 100, show the output lines for the following statements:

```
WriteLn ('X is ' :10, X :6:2, 'I is ' :4, I :5);
Write ('I is ' :10, I :1):
WriteLn ('X is ' :10, X :2:1)
```

Programming

1. A researcher wants to display a table of readings from an experiment. Each line will contain an integer from 1 to 1000, to indicate the reading number (value of Reading), and the pressure amount (value of Pressure), which is always less than 100 pounds. Give a WriteLn statement that will display outputs in the form

```
RRRRRRRRRRRRPP, PPP
```

where each R is a digit of the reading value, each P is a digit of the pressure value, and each O is a space.

2. Write a series of statements that will display a three-line heading consisting of your name, your school, and its city and state. Each line should be approximately centered on the computer screen.