Midterm Review

Chapter 1

1. What are the three criteria an algorithm must satisfy?
2. What is JVM (Java Virtual Machine)?

Chapter 2

1. Indicate the class hierarchy in the program in FIGURE 2-9, p. 46.

Chapter 3

1. What are the two attributes that define a data type?
2. What are the three important attributes of a variable?
3. Indicate the values and types of the following expressions:
   a) 2 + 3
   b) 19 / 5
   c) 19.0 / 5
   d) 3 * 6.0
   e) 19 % 5
   f) 2 % 7
4. By applying the appropriate precedence rules, calculate the result of each of the following expressions:
   a) 6 + 5 / 4 - 3
   b) 10 + 9 * ((8 + 7) % 6) + 5 * 4 % 3 * 2 + 1
5. If the variable k is declared to be of type int, what value does k contain after the program executes the assignment statement
   \[ k = (\text{int}) 3.14159; \]
   What value k contain after the assignment state
   \[ k = (\text{int}) 2.71828 \]
6. Write the truth table for the && (and) operator.
7. Write the truth table for the || (or) operator.
8. Write the truth table for the ! (not) operator.
9. What is De Morgan’s law?
10. How would you write a Boolean expression to test whether the value of the integer variable n was in the range 0 to 9, inclusive?
11. Describe in English what the following conditional expression means:
   \((x \neq 4) \lor (x \neq 17)\)
   For what values of \(x\) is this condition true?

12. In the program in FIGURE 3-5, p. 87, how are the named constants defined? How does the program center the figure?

Chapter 4

1. What \texttt{for} loop control line would you use in each of the following situations:
   a) Counting from 1 to 100.
   b) Counting by sevens starting at 0 until the number has more than two digits.
   c) Counting backward by twos from 100 to 0.

2. In the program in FIGURE 4-2, p. 104, how does the program add a list of integers using a sentinel?