CHAPTER 4
EXTRA RESOURCES

Additional Resources

1. "Ask a Question" (*http://tiny.cc/askquestion/*): Sign in to ask the Small Basic community on MSDN forums! You'll get an answer very quickly!

2. "Invalid Variable Names" (*http://tiny.cc/invalidvariables/*): Check out examples of illegal variable names and learn why they're invalid.

3. "Algebra vs. Small Basic" (*http://tiny.cc/algebraversus/*): Learn about a key difference between algebra and Small Basic.

4. "Combining Strings and Variables" (*http://tiny.cc/combining/*): Discover what to watch out for when displaying text and variables.

5. "Creating Different Variables" (*http://tiny.cc/differentvariables/*): Read about best practices and see examples for using distinct variables.

6. "Small Basic Reference Documentation: Math Object" (*http://tiny.cc/mathobject/*): Learn about the different methods for the Math object.

7. "Decimals Are Floating-Point Numbers" (*http://tiny.cc/floating pointnumbers/*): Learn what a floating-point number is.
8. "Strongly Typed Languages" (*http://tiny.cc/stronglytyped/*): Learn what *strongly typed* means.
9. "Automatic Type Conversion" (*http://tiny.cc/typeconversion/*): Learn how Small Basic converts types to make them compatible.
10. "Scientific Notation" (*http://tiny.cc/scientificnotation/*): Follow the examples to learn how to write in scientific notation in Small Basic.
11. "Variables as Named Constants" (*http://tiny.cc/namedconstants/*): Learn how to set a command into a variable.

Review Questions

1. What does a variable do?
2. Which characters can you use in a variable name?
3. Which characters can a variable name start with?
4. Why is it important to use meaningful variable names?
5. Is the variable grade the same as GRADE? Why or why not?
6. Which of the following is considered a legal assignment statement in Small Basic?
   a. x = 10
   b. 5 = x

Practice Exercises

1. What's the output of this program?

```
y = 100
TextWindow.WriteLine(y + " and one dalmatians")
```

2. What's the output of this statement?

```
TextWindow.WriteLine(Clock.Date + " is the day I rocked Small Basic.")
```

   Note that Clock is an object defined in the Small Basic library, and Date is a read-only property of the Clock object.

3. Assume that a = 2, b = 3, and c = 5. What's the result of evaluating each of these expressions?
   a. (a + b) / c
   b. (a + b + c) / (2 * a)
   c. 4 * a − 3 * b + c

4. What are the values of x and y after executing each statement in the following program?

```
' VarTest.sb
' Test how the assignment operator works
x = 12
y = x / 2 + 2     ' x =     y =
x = y / 2 + 2     ' x =     y =
y = x / 2 + 1     ' x =     y =
```

5. Translate these mathematical expressions to Small Basic statements:

a. $y = \dfrac{8 + (4 \times 5)}{(4 \times 2) - 6}$

b. $y = \dfrac{(3 \times 3 \times 3 \times 3) + 9}{(5 \times 4) + 10}$

6. What's wrong with the following program? How would you fix it?

```
' Error.sb
' Solve a * x - b = 0 for a = 2 and b = 6
a = 2
b = 6
b / a = x
TextWindow.WriteLine("x = " + x)
```

7. Find and fix the error in this program:

```
' Error.sb
' This program computes 6% tax on $2200
price = 2200
taxPrcnt = 0.06
price * taxPrcnt = taxAmount
TextWindow.WriteLine("The tax is: $" + taxAmount)
```

8. You can transform your computer into a comedian! Try the following program. Read the help about the PauseWithoutMessage() method, and then modify the program to add more jokes.

```
' Comedian.sb
' Transform your computer into a comedian
joke1 = "Why did the chicken cross the road?"
ans1 = "To get to the other side."
joke2 = "Why did the farmer call his pig Ink?"
ans2 = "Because it always ran out of the pen!"

TextWindow.WriteLine(joke1)
TextWindow.PauseWithoutMessage()
TextWindow.WriteLine(ans1)
TextWindow.WriteLine("")
```

```
TextWindow.WriteLine(joke2)
TextWindow.PauseWithoutMessage()
TextWindow.WriteLine(ans2)
TextWindow.WriteLine("")
```

9. The following program swaps the values stored in variables a and b. Study the program and explain how it works:

```
' Swap.sb
' Swap the values of two variables
a = 2
b = 5
TextWindow.WriteLine("Before: a = " + a + ", and b = " + b)

temp = a
a = b
b = temp
TextWindow.WriteLine("After: a = " + a + ", and b = " + b)
```

10. Complete this program to determine how much you'll weigh on the moon. Read the help of the Round() method to see what it does.

```
' MoonWeight.sb
' Compute your weight on the moon
CONV_FACTOR = 1 / 6   ' To convert Earth weight to moon weight
wtEarth = ...         ' Weight on Earth in pounds
wtMoon = ... * CONV_FACTOR  ' Weight on the moon
wtMoon = Math.Round(wtMoon) ' Round the number we got
TextWindow.WriteLine("I am " + wtEarth + " lbs on Earth.")
TextWindow.WriteLine("I'll be " + wtMoon + " lbs on the moon.")
```

11. You and your friends started a recycling campaign. In total, you collected 3,650 cans that you exchanged for 8 cents each. You plan to donate the money to the Planet Saving Organization. Complete the following program to see how thankful the organization will be:

```
' RecyclingCampaign.sb
' Calculate money obtained by recycling cans
numCans =
canPrice =
cash = (numCans * canPrice) / 100    ' In dollars
TextWindow.WriteLine("We thank you " + cash + " times!")
```

12. Your family plans to drive 500 miles north for your summer vacation. Your minivan gets 18 miles per gallon, and the fuel price is $3.50 per gallon. Assuming an average speed of 60 miles per hour, write a program to compute the driving time (in hours) and the trip's fuel cost.

13. Write a program that converts a given temperature in degrees Celsius to degrees Fahrenheit.