# CHAPTER 7
# EXTRA RESOURCES

## Additional Resources

1. "Small Basic Reference Documentation: Math Object" (*http://tiny.cc/mathobject/*): Explore this Small Basic reference documentation page.

2. "Rounding Method Details" (*http://tiny.cc/roundingmethods/*): Dig deeper for details about Small Basic's rounding methods.

3. "Remainder with Negative Numbers" (*http://tiny.cc/remainder/*): Learn more about negative numbers.

4. "Generating a Random Character" (*http://tiny.cc/randomcharacter/*): Get a quick tip for using `GetRandomNumber()` to generate a random letter.

5. "Is It Really Random?" (*http://tiny.cc/notrandom/*): Learn why `GetRandomNumber()` isn't random.

6. "Trigonometric Methods" (*http://tiny.cc/trigonometric/*): Learn all about the `Math` object's Trigonometric methods.

# Review Questions

1. What does the `Power()` method do?
2. What are the differences between the `Round()`, `Floor()` and `Ceiling()` methods?
3. Describe what happens in the following code:

   ```
   ans = Math.Min(Math.Min(28, 27), 8)
   ```

4. Write a Small Basic statement that returns a random number between 10 and 20, inclusive.

# Practice Exercises

1. The following program computes the sine of an angle (in degrees) that's entered by a user. Explain how the program works.

   ```
   ' SineCalc.sb
   ' Calculates the sine of an angle given in degrees

   TextWindow.Write("Enter angle (in degrees): ")
   deg = TextWindow.ReadNumber()    ' Angle in degrees
   rad = Math.GetRadians(deg)       ' Angle in radians
   ans = Math.Sin(rad)              ' Computes the sine
   TextWindow.WriteLine("sine(" + deg + ") = " + ans)
   ```

2. The following program converts a given number of days to minutes. Complete the program, run it, and then explain how it works.

   ```
   ' DaysToMin.sb
   ' Tells you how many minutes in any number of days

   TextWindow.Write("How many days? ")
   days =    ' Reads the number of days
   mins =    ' Does the calculation

   TextWindow.Write("There are " + mins + " minutes in ")
   TextWindow.WriteLine(days + " days.")
   ```

3. Write a program that lets you convert dollars into Swiss francs. Assume that 1 US dollar equals 0.90 Swiss francs. The program should prompt the user to enter a dollar amount (such as 325.0) and then display the equivalent number of Swiss francs (rounded to the nearest integer).

4. Write a program that simulates throwing two dice. The results should be printed as follows:

---

```
You rolled: 3   5
```

---

5. Let's measure the period of a pendulum, the time it takes the pendulum to swing from one side to the other and back. A pendulum's period $T$ (in seconds) is related to its length $L$ (in feet) by the following equation:
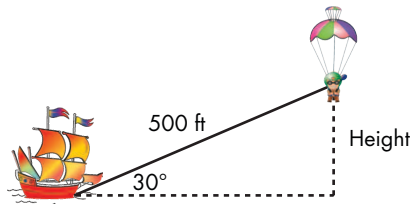
$$T = 1.1\sqrt{L}$$

Write a program that computes the period of the pendulum in the Science Museum of Virginia, which is about 96 feet long.

6. The distance $d$ between two points $(x_1, y_1)$ and $(x_2, y_2)$ in the graphics window is given by this formula:

$$d = \sqrt{\left(x_2 - x_1\right)^2 + \left(y_2 - y_1\right)^2}$$

Write a program that reads the coordinates of the two points from the user and the displays the distance between them (rounded to the nearest pixel).

7. You're in an air balloon and being pulled by a tow rope attached to a boat, as shown here.



The tow rope is 500 feet long and makes a 30° angle with the horizontal. Write a program to calculate your height above the boat (rounded to the nearest feet).

8. The surface area $S$ of a cylinder with radius $r$ and height $h$ is given by the following equation:

$$S = 2\pi r^2 + 2\pi rh$$

Write a program that computes the surface area of a potato chips container whose radius is 2.5 inches and whose height is 6 inches.

9. You have 10 marbles in a bag, numbered from 1 to 10. You draw 3 marbles (one at a time) at random. After each draw, you return the marble back to the bag. Write a program that simulates this experiment. Display the numbers of the three marbles that you draw.

10. You bought a new car for $20,000. The car's value $t$ years after purchase is approximated by this equation:

$$V = 20{,}000(0.9)^t$$

Write a program to find the value of your car after five years.

11. Write a program that finds the minimum of five scores entered by the user.