Shapes Class

Constructors:

1. Calling the constructor with no parameters sets side1 to 1, side2 and side3 to 0 and the shape to a circle.
2. Calling the constructor with 4 parameters sets each side (side1, side2 and side3) to the value passed and the shape to the shape passed.
3. Calling the constructor with 3 parameters sets side1 and side2 to the values of the first two parameters and side3 to 0. It sets the shape to the value of the third parameter.
4. Calling the constructor with 2 parameters sets side1 to the value of the first parameter, side2 and side3 to 0 and the shape to the value of the second parameter.

Area:

There is a method to calculate the area of a square, rectangle, triangle and circle. They work as follows:

1. areaOfSquare has one parameter length and returns the length squared (length multiplied by itself)
2. areaOfRectangle has two parameters, length and width and returns length multiplied by width
3. areaOfCircle has one parameter radius and returns Pi \* radius squared (Pi \* radius \* radius)
4. areaOfTriangle has two parameters base and height and returns ½ \* base \* height

Perimeter

There is a method to calculate the perimeter (distance around) each shape. They work as follows:

1. perimeterOfSquare has one parameter length and returns the length \* 4
2. perimeterOfRectangle has two parameters, length and width and returns 2 times the (length plus the width)
3. perimeterOfCircle has one parameter radius and returns Pi \* radius \* 2
4. perimeterOfTriangle has three parameters side1, side2 and side3. It first checks to see if the shape is a valid triangle (sum of two shorter sides > third side). If it is not a triangle it returns -1. If it is, it returns the sum of the three sides.

Volume

There is a method to calculate the volume three shapes as a three dimensional shape based on the 2-d equivalent shape. There is no calculation for the volume of a triangular prism. The other functions work as follows:

1. volumeOfSquareCube has one parameter length and returns the length times itself 3 times (length \* length \* length)
2. volumeOfRectangularCube has three parameters, length, width and height. It returns length \* width \* height
3. volumeOfSphere has one parameter radius and returns 4 \* 3 \* Pi \* radius cubed (radius \* radius \* radius)

General Methods

There are three generic methods that call the above methods to perform the calculation. They are:

1. Area. Determines the shape of the object and calls the appropriate function to measure the area. If the shape is a rectangle, first check to see if it is a square by checking the side1 == side 2 or side2 = 0.
2. Volume. Determines the shape of the object and calls the appropriate function to measure the area. If the shape is a rectangle, first check to see if it is a square by checking the side1 == side 2 or side2 = 0. If the shape is a triangle, return -1
3. Perimeter. Determines the shape of the object and calls the appropriate function to measure the area. If the shape is a rectangle, first check to see if it is a square by checking the side1 == side 2 or side2 = 0.