Geometry: Area of a Regular Polygon

A regular polygon is an n-sided polygon in which all sides are of the same length and all angles have the same degree (i.e., the polygon is both equilateral and equiangular). The formula for computing the area of a regular polygon is:

area = n * s ^ 2 / (4 * tan(pi / n))

Here, **s** is the length of a side and **n** is the number of sides.

Write a program that prompts the user to enter the number of sides (int) and their length (double), and then displays the area of the regular polygon. The program should display an error message and quit if num sides are less than 3 or side length is less than or equal to zero. Remember all sides of a regular polygon are the same length, so you only need to ask for that value once.

For the calculation of area, you will use the Math class function **Math.tan()** and the Math class constant **Math.PI**. Do not create your own variable for PI.

Make sure all variables a name appropriately with self-documenting identifiers (e.g., *int numSides;*).

You can test your program against this online calculator.

Example Output

```
Enter the number of sides: 5
Enter the length of each side: 2.5
The area of the polygon is 10.752983753681043
```

```
Enter the number of sides: 2
Number of sides must be greater than 2. Exiting.

Process finished with exit code 0
```

```
Enter the number of sides: 5
Enter the length of each side: 0
Length of sides must be greater than 0. Exiting.

Process finished with exit code 0
```

Deliverables

Make sure your code has the required file header and correctly formatted identifier names, as outlined in the CS Java Documentation Policy under Course Info on D2L.

To receive credit for this lab you must

1. Demonstrate the code and execution to the instructor during this lab, during office hours, or during the next lab period.
2. Zip the src folder in your project directory and upload the instructor approved .java files to the Lab 8 D2L drop box.