

1. Write a program to calculate the volume and surface areas of a **regular pyramid** shape based on the user input of base and height.

The algorithm is as follows:

Prompt the user to enter the **base** and **height**.

If user inputs are invalid:

Print an error message

Else:

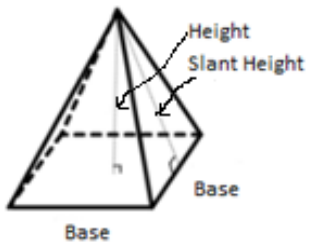
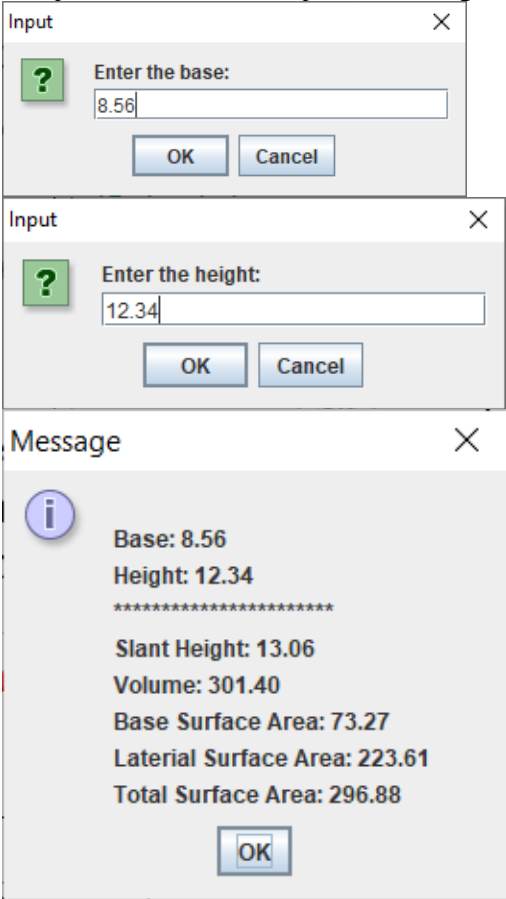
Calculate the slant height.

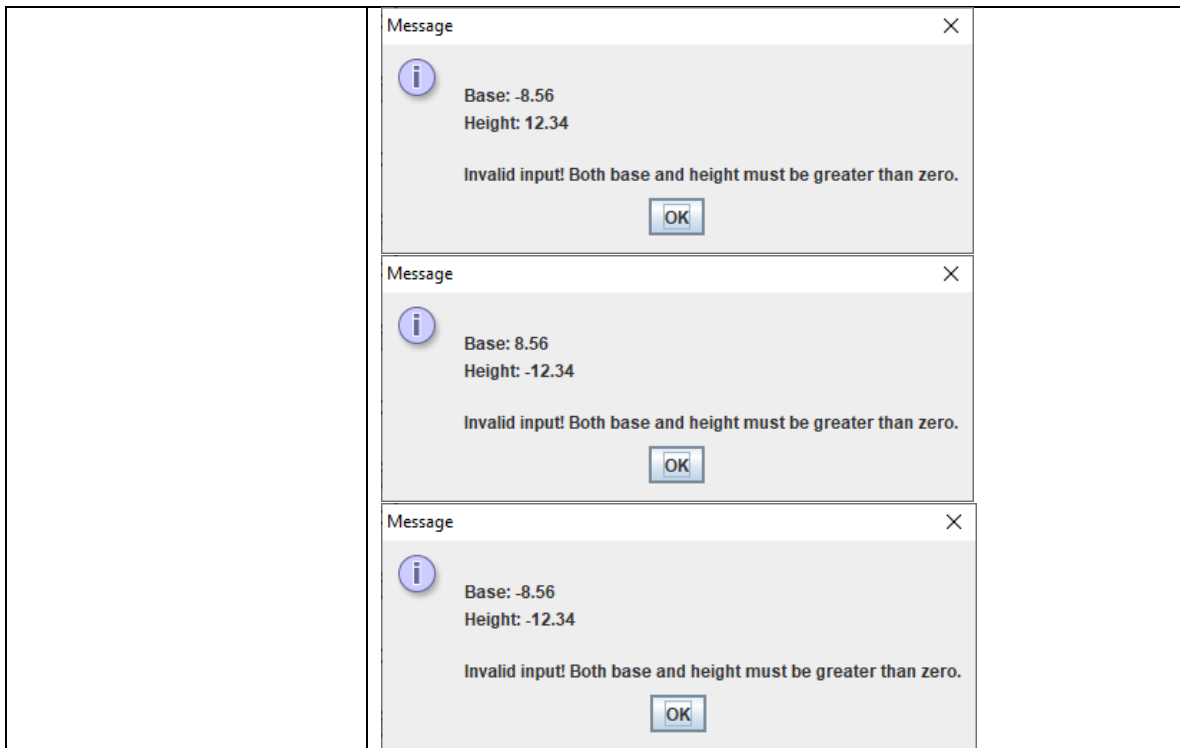
Calculate the volume, lateral surface area, base area, and total surface area.

Output the pyramid's information (See the sample run).

The results should be formatted to 2 decimal places.

Sample Run (It is **not** required to use JOptoinPane.)

	<p>Sample Run with valid input (both are greater than 0)</p>  <p>Sample Run with invalid input</p>
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2. Write a program that asks the user to enter the vehicle information, number-of-miles-driven and gallons-of-gas-used, then calculates the car's miles-per-gallon (MPG) and prints the result. The program also prints a message indicating whether or not the MPG is above, or below, or equal to the national average.

The requirements are as follows:

- a. Prompt the user to input the vehicle information, miles-driven and gallons-of-gas-used
- b. If the user input is invalid, print an error message
Otherwise, calculate MPG
- c. Output the result including the vehicle information, mile-driven and gas-used
- d. If the MPS is more than 24, print a message indicating that it is above national average
Otherwise, print a message indicating that it is equal to or below national average
- e. Use System.out.printf method to format the decimal places.

Sample Run:

```
Enter the vehicle information: Ford F-150
Enter the number of miles driven: 123.45
Enter the gallons of gas used: 5.6
```

```
*****
Vehicle: Ford F-150
Miles Driven: 123.45
Gallons Spent: 5.6

Miles-per-gallon (MPG): 22.04

The car's MPG is below the national average.
```

```
Enter the vehicle information: Ford F-150
Enter the number of miles driven: -123.45
Enter the gallons of gas used: 5.6
```

```
Invalid input. The values should be greater than zero.
```

```
Enter the vehicle information: Ford F-150
Enter the number of miles driven: 123.45
Enter the gallons of gas used: -5.6
```

Invalid input. The values should be greater than zero.

```
Enter the vehicle information: Ford F-150
Enter the number of miles driven: -123.45
Enter the gallons of gas used: -5.6
```

Invalid input. The values should be greater than zero.

Due: Wednesday, 9/14/22

- To receive full credit, the assignment must be submitted by the due date.
- Late submissions will incur a penalty of 5% per day.
- Upload the source code files to D2L.

Requirements

Use Java techniques and features we have learned:

- Primitive data types, String type, and standard input & output devices
- Write the program in main method

Style, form, documentation, naming convention, and more

Each program should have a file header section. /* * Author: Your name * Date: Date of completion * Assignment: Assignment # NameOfSourceCode.java * Description: The program description */	Up to 5% deduction
Each program should be written with the appropriate form and style. Use indentation, blank line, and comments to make the source code easy to read.	Up to 5% deduction
Use Java naming convention and meaningful names to name the classes, methods, variables, constants, and other identifiers in the programs.	Up to 5% deduction
Format the output appropriately	Up to 5% deduction