

Program 1

Problem:

The city of Beenieville is installing a new water tower. The area and volume of the sphere are needed to determine the water capacity of this new tower. Using the formulas below, calculate the area of the sphere in inches and then in feet. Then use the volume in feet to determine the total gallons of water needed.

Area of the sphere in inches	$A = 4\pi r^2$
Area of the sphere in feet	$AFt = A / 12$
Volume of a sphere in inches	$V = \frac{4}{3} \pi r^3$
Volume of a sphere in feet	$VFt = V / 12$
Gallons of water	$VFt \times 7.48$

Input and Output:

Using these formulas as a basis, write a program that prompts and asks the user for the width of the sphere in inches and then calculates the radius, radius squared and the radius cubed and stores these values into variables. Use these variables in the formulas. In writing your program, do the following:

- Make the value of pi 3.14 and the gallons conversion variable 7.48 as constants.
- Calculate the radius by dividing the width by 2 and store result in a radius variable.
- Calculate radius squared and radius cubed and store these results in variables
- Calculate the area in inches and in feet, the volume in inches and in feet and the gallons of water needed. Store each of the results into variables.
- Output the results.

Output values should all be labeled. Follow the sample run of the program given below for format. Numbers in bold are values entered by the user.

```
Enter the width of the sphere
400
Area in inches = 502,400.00
Area in feet = 41,866.67
Volume in inches = 33,493,333.33
Volume in feet = 2,791,111.11
Gallons of water = 20,877,511.11
```

Requirements

Complete the test data and test your program using the results from the test data.
(Program 1 Test Data.docx)

Write your program in a class called `WaterTowerCalculator.java` that has a `main` method. All values should be declared as double values.

Instructions, prompts, and answers should be in the form given above. Input should be entered by the user from the keyboard. Output should be displayed on the console.