CS1400: Rainwater Storage Tank Calculator

Rainwater can be collected and stored for later use in many situations. Some people do this at their homes and use the water for washing cars, watering gardens, etc. Wildlife management personal and ranchers do it to provide more water for the wildlife and livestock.

The catchment systems usually consist of 1) a catchment area, a rectangular area that slopes downhill, 2) a tank to store the water that runs off of the catchment area.

It’s important to have a tank large enough to capture the water from big storms, but not so big that it never fills up.

You will make a program that helps water conservationists calculate the size they want for their catchment tank.

Assignment

Write a program that asks the user for the width and length of their catchment area, and the amount of rain that falls in big storms in their area. Then, the program will calculate the number of gallons of rain that may be captured in such a storm, and suggest the size of tank the user should use.

There are about 7.48 gallons per cubic foot. There are 12 inches per foot.

Additional Documentation

Here is an article that can provide more information.

- Rainwater Harvesting

Potential Sessions

Sample 1

Welcome to the rainwater tank calculator.  
We'll ask you for a few parameters about your rainfall and rain catchment area.  Then, we'll tell you how big to make your tank.  We assume that your catchment area is rectangular.

How many inches of rain fall in a large storm? .5
How wide is your catchment area, in feet? 45
How long is your catchment area, in feet? 20

You need a tank with 280.5 gallons capacity to capture that much rain at one time.

Sample 2

Welcome to the rainwater tank calculator.  
We'll ask you for a few parameters about your rainfall and rain catchment area.  Then, we'll tell you how big to make your tank.  We assume that your catchment area is rectangular.

How many inches of rain fall in a large storm? 1.5
How wide is your catchment area, in feet? 180
How long is your catchment area, in feet? 125

You need a tank with 21037.5 gallons capacity to capture that much rain at one time.

Show Off Your Work
To receive credit for this assignment, you must show your source code and demonstrate your running program.

Ask your instructor who they would like you to show the assignment to.