



## Backyard Pond Sizer

Problem #3

Novice / Advanced

4 points

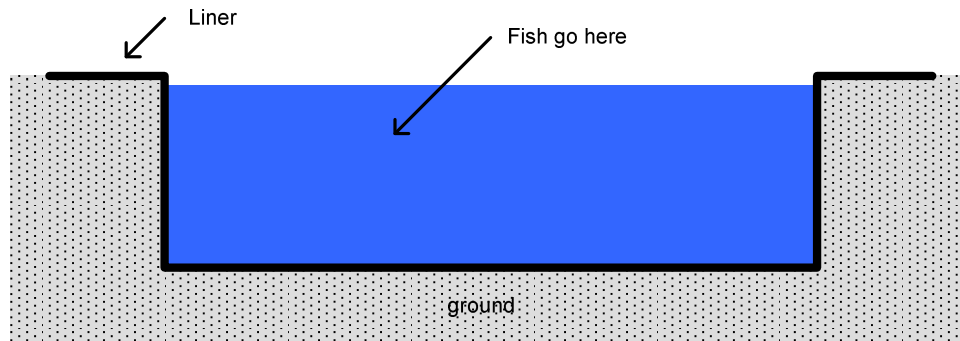
C programmers: your program name must be: prob03.exe  
JAVA programmers: your program name must be: Prob03.class

### Task Description

Your home and garden shop is growing rapidly, and you've added backyard pond supplies to your store. The customers know their pond's dimensions, but you need a different set of measurements. To properly size the pump, you need to know how many gallons of water the pond will hold. The number of fish the pond can maintain is dictated by the pond's surface area. And you need to calculate the size of the rubber sheet (called a "liner") that creates the bottom and sides of the pond.

Being an excellent computer programmer, you decide to write a "pond sizer" that will calculate these values, given the pond's dimensions. Your program must do the following:

- Calculate the surface area (in square feet) of any size circular or rectangular pond
- Calculate the number of gallons the pond can hold (a cubic foot of water is equal to 7.5 gallons)
- Compute the size of the rubber liner necessary to line the bottom and sides of the pond. The liner must also leave an extra foot of material along all outside edges of the pond.



Note that liner material is purchased in one rectangular piece; for circular ponds, extra material will be trimmed off. The liner size should be expressed in terms of length and width (in feet) rounded up to the next whole foot.

Area of Rectangle = Length  $\times$  Width    Area of Circle =  $\pi \times (\text{diameter} / 2)^2$     Volume = Area  $\times$  Depth

### Program Input

Prompt for the type of pond to be constructed – either circular (enter a "C") or rectangular (enter an "R"). Then, prompt for the pond's dimensions. For circular ponds, prompt for the diameter (in feet) and the depth (in inches). For rectangular ponds, prompt for length, width (in feet), and depth (in inches).

### Program Output

Your program will output to the screen the surface area of the pond (in square feet, round down), the amount of water the pond will hold (in gallons, round down), and the size of the liner necessary (length and width, in feet, rounded up).

### Sample Program Input / Output

```
Enter type of pond (Circular or Rectangular): R
Enter the length of the pond (in feet): 3
Enter the width of the pond (in feet): 4
Enter the depth of the pond (in inches): 18
```

Pond has a surface area of 12 square feet.  
Pond will hold 135 gallons of water.  
Required liner size is: 8 by 9 feet.

Enter type of pond (Circular or Rectangular): C  
Enter the diameter of the pond (in feet): 5  
Enter the depth of the pond (in inches): 24

Pond has a surface area of 19 square feet.  
Pond will hold 294 gallons of water.  
Required liner size is: 11 by 11 feet liner.

Enter type of pond (Circular or Rectangular): R  
Enter the length of the pond (in feet): 12  
Enter the width of the pond (in feet): 33  
Enter the depth of the pond (in inches): 44

Pond has a surface area of 396 square feet.  
Pond will hold 10890 gallons of water.  
Required liner size is: 22 by 43 feet.