Matlab practical in two parts

On this assignment you are not allowed to discuss the project with anyone. The GSIs and instructor will only answer questions related to clarifying the specification. We will not be providing any help with programming, debugging, or the like. You are allowed to use code you've written previously in the class, code we've handed out to you, and anything from our textbook. Each part is worth 50% of the grade. It is due Tuesday the 19th at 6pm in a directory named "Prac2"

Part One: Big Jim Walker

A ball is placed on a 4 foot by 8 foot table. The ball is propelled in a certain direction until it falls off the table. You are to write a function "table" which takes three real-valued scalar arguments:
- Starting X location (indicates the distance from the left side of the table in feet.)
- Starting Y location (indicates the distance from the bottom of the table in feet.)
- Angle of propulsion (number greater than or equal to 0 and less than 360). This is the angle (in degrees) the ball is propelled, where 0 degrees is toward the top of the table and 90 degrees is to the right.

Your function is to return a row vector with two values: the X and Y location where the ball falls off the table.

The figure on the right shows the starting point of the ball on the table (location X, Y). Say the ball is propelled at a 90 degree angle. The ball will fall off the table at location (4,Y). If the ball were propelled at 0 degrees it would fall off at location (X, 8).

Top

Right

Left

8 foot

X

Y

Bottom

There are a number of ways to solve this. But the easiest is to slowly move the ball in the correct direction until it moves past one of the edges of the table. Your answer should be accurate to within one hundredth of a foot. You may assume the ball starts on the table.
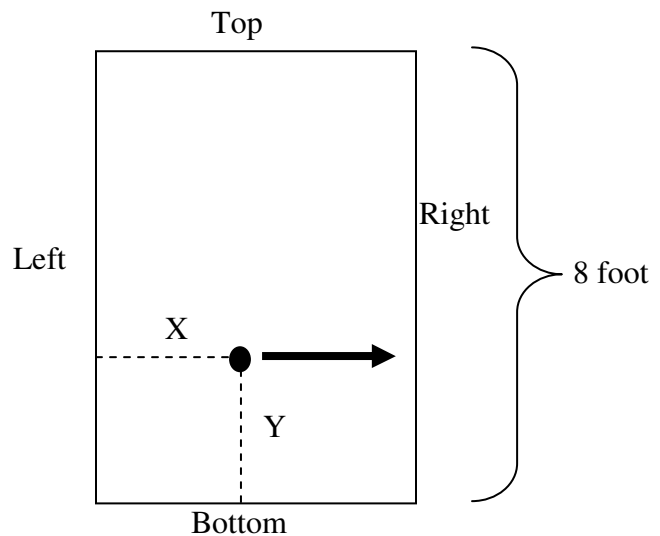
examples:
>> table(2,2,0)

ans =

   2.0000   8.0000

>> table(2,2,90)

ans =

   4.0010   2.0000

Part Two: Show me the Money

The present value of an annuity (a yearly sum of money) may be computed from the formula

$$P = (A/i) \, [(1 + i)^n - 1]/(1 + i)^n$$

where A is the annuity (in dollars/year), i is the nominal yearly interest rate (in decimal form), n is the number of years over which the annuity is paid and P is the present value (in dollars).

Example computation: If i = 0.15 (15%), A = $100/year and n = 10 years then
$\qquad$ P = $501.88.

This can be really useful to know if you were to win the $1,000,000 State Lottery and the Lottery offered you the choice of $500,000 today or $50,000/year for 20 years and you expected the rate of inflation (interest) would be 5% per year.

Write a function named "annuity" which takes three scalar arguments. The first is a "low" interest rate, the second is a "high" interest rate, and the third is a number of years. your program is to return a row-vector with 10 values. The first value would be value of an annuity that pays out $1000.00 a year assuming the "low" interest rate. The last would be the value of an annuity which pays out $1000.00 a year assuming the "high" interest rate. The other elements of the row vector would assume an interest rate evenly spaced between the "low" and the "high" rates.

(Based on a problem from: http://www.facstaff.bucknell.edu/maneval/help211/progexercises.html)