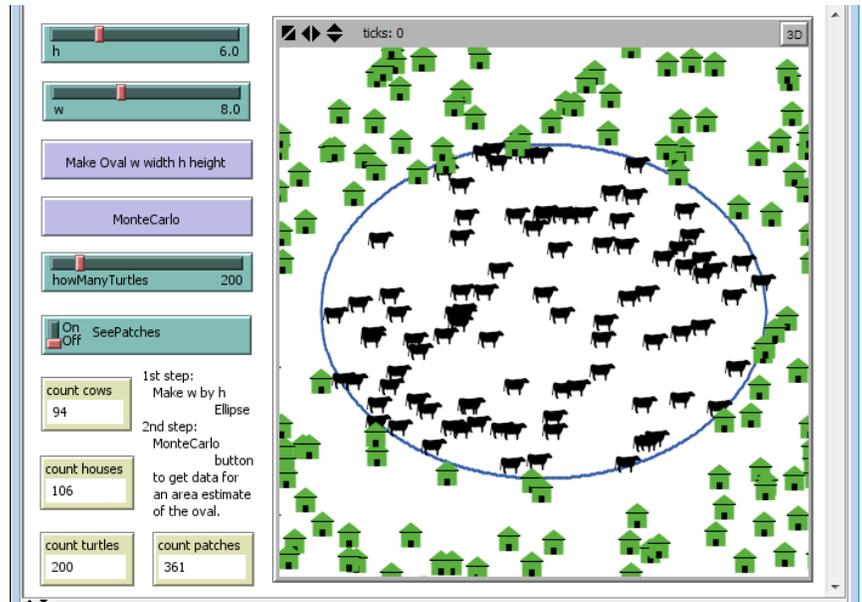


Name _____

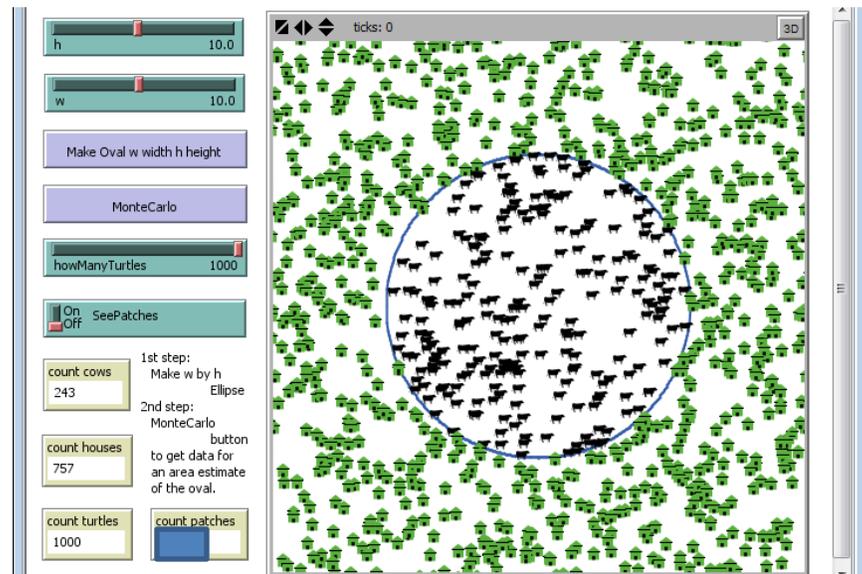
Monday, October 17, 2016

1. MONTE CARLO PROBLEM ONE



In the formula $a = (b/c) * d$ this is the classic problem. You are trying to find a and you know or can determine b and c and d.

2. MONTE CARLO PROBLEM TWO



The formula is $a = (b / c) * d$.

See and study these notes!!!!

http://www.cs.uni.edu/~jacobson/025/f/MonteCarlo11_14_2012.pdf

Some students calculated d to be SMALLER THAN a. Why would you know to redo your work if you came up with a an answer here where area of the GRID in patches was less than 314.159? If a farmer owns 200 acres and says that he or she is going to give you part of it to use and then says: You get 345 acres of my 200 acres, what is wrong with this logic??? Understand the formula. Can you attempt 10 free throws and make 21 out of 10?

MONTE CARLO PROBLEM ONE (Worth 10 pts)

For the following, use the Monte Carlo method. What is the estimated area of the OVAL by Monte Carlo?

You are to answer this question on the separate sheet of paper. This sheet is just for you to look at as you figure out the problem and set up the equation to solve it.

The screenshot shows a NetLogo simulation window titled "DrawOvalMonteCarlo531 - NetLogo {C:\2016\1025FYO}". The window has a menu bar (File, Edit, Tools, Zoom, Tabs, Help) and a toolbar with buttons for Edit, Delete, Add, and a "Button" dropdown. A speed slider is set to "normal speed", and there are checkboxes for "view updates" (checked) and a "continuous" dropdown. A "Settings..." button is also present.

The main workspace displays a 19x19 grid of patches. A blue oval is drawn over the grid. The oval's width is 8 patches and its height is 6 patches. The grid contains green house icons and black cow icons. The oval is filled with black cow icons, and the area outside the oval is filled with green house icons.

The interface includes several controls and monitors:

- Sliders for "h" (6.0) and "w" (8.0).
- A button labeled "Make Oval w width h height".
- A button labeled "MonteCarlo".
- A slider for "howManyTurtles" (200).
- A toggle for "SeePatches" (On).
- Monitors for "count cows" (94), "count houses" (106), "count turtles" (200), and "count patches" (361).
- Instructions: "1st step: Make w by h Ellipse" and "2nd step: MonteCarlo button to get data for an area estimate of the oval."
- A "Command Center" at the bottom with a "Clear" button and the prompt "observer >".

Note the area of the above world or the turtle grid is 19 rows by 19 columns of patches, or 361 patches.

VIP: Note that you MUST SHOW YOUR WORK! SHOW ALL OF YOUR WORK and the entire step by step process of getting the answer as to what the estimated area of the OVAL is.

MONTE CARLO PROBLEM TWO (Worth 10 pts)

For the following, we have a perfect circle with a RADIUS of 10 and thus a DIAMETER of 20. Recall that the AREA of a circle is PI times RADIUS squared, i.e. πR^2 . PI is 3.14159, of course. Calculate and work out the estimate for the area of the entire turtle world using Monte Carlo. The Monte Carlo estimated AREA of the TURTLE GRID WORLD will be in square patches. YOU MUST SHOW ALL OF YOUR WORK and STEP BY STEP PROCESS OF ARRIVING AT THE ANSWER!

DrawOvalMonteCarlo531 - NetLogo {C:\2016\1025FYO}

File Edit Tools Zoom Tabs Help

Interface Info Code

Edit Delete Add abc Button normal speed view updates continuous Settings...

h 10.0

w 10.0

Make Oval w width h height

MonteCarlo

howManyTurtles 1000

On Off SeePatches

count cows 243

count houses 757

count turtles 1000

count patches

1st step: Make w by h Ellipse

2nd step: MonteCarlo button to get data for an area estimate of the oval.

Command Center

observer >

ANSWER THIS QUESTION on the separate TEST PAGE, which has plenty of space to SHOW ALL OF YOUR WORK!

This page is just for you to see the entire problem and the Monte Carlo simulation results.

Where is Waldo questions 3 and 4. (Worth 10 pts each)

```

TO createWhereIsWaldo
  ca

  ask patches [ set pcolor white ]

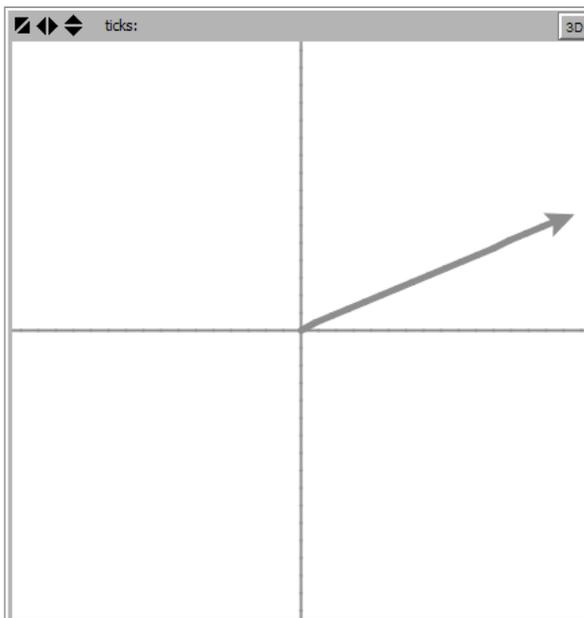
  cro 1

  ask turtles
  [
    pd
    set pen-size 2
    drawAxis
    set pen-size 5
    set size 2

    rt 67

    fd 16
  ]
END

TO drawAxis
  fd 33      ;; draw the y axis
  rt 90
  fd 33      ;; draw the x axis
  lt 90      ;; face 0 degrees again
END
  
```



Find the exact **xcor** and **ycor** location of the turtle using Trigonometry. SHOW ALL WORK!

Use the Windows Calculator as needed. You cannot use your own calculator on the test.

If there is not a shortcut to get to the Windows calculator on the test, just type CALC to find it, as we have done in class.

YOU MUST **SHOW ALL YOUR WORK** TOO! Every step, numerator and denominator and formula setup, etc. Your answer goes on the separate page. Including a picture or the drawing/sketch is helpful to communicate your solution and to help you solve it too.

VIP: DETAILED ANSWERS ON SEPARATE PAGE!!!

Note that $90 - 67$ equals 23. Most prefer to use the 23 degree angle to solve the problem.

Why would you accept an answer where **ycor** is GREATER THAN **xcor**? Draw a picture of the triangle. Write down the length of the adjacent leg (xcor) and the length of the opposite leg (ycor) so that the ycor IS GREATER THAN xcor. What is wrong with your answer if the $ycor > xcor$? Maybe you used SINE where you should have used COSINE and vice versa. WHY? WHY? WHY?