COSC150 ICA 24 March 2022 Name/Pledged_____

We started this course by asserting that scientists communicate in two basic ways: drawing pictures and telling stories. We've spent several weeks doing that!

Do your best to answer the following:

1. We have asserted since the first class that a description of modern science can be simplified down to three inter-related actions of the human person. What are they?

2. For the purposes of this course, define "investigation."

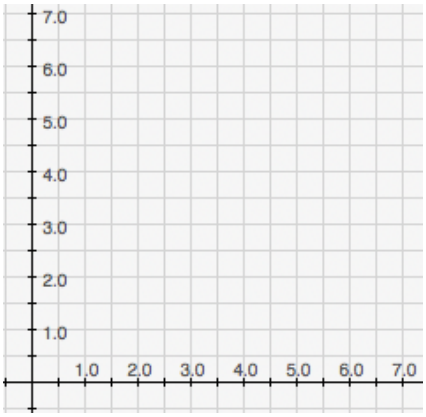
3. Name at least three characteristics that transform an "investigation" into a "scientific investigation"

4. A model that has at least one element of randomness can be described as _____.

5. A model whose behavior depends solely on its parameter values and its initial conditions can be described as _____.

6. The Euler Method iterates models and systems using what simple equation?

7. Consider a quadratic function in the form: $y(x) = 2(x-3)^2 + 4$



a. Sketch the main features of this function near its vertex.

b. If this same function were written in the form: $y(x) = ax^2 + bx + c$ what are ***a, b,*** and ***c***?

8. Models in a scientific investigation usually serve one or more of five main purposes. They are:

a. S_____

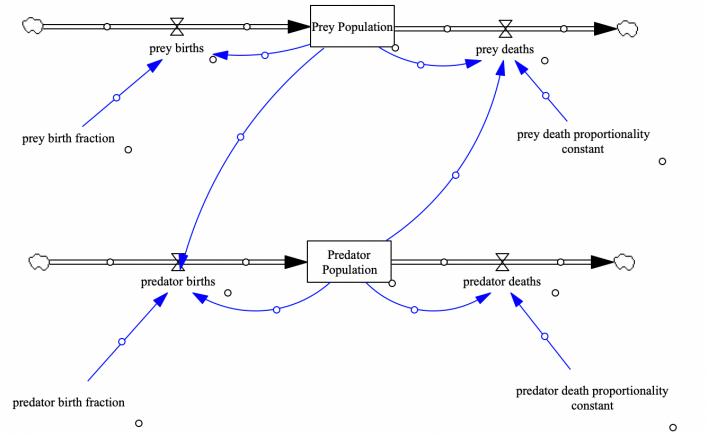
b. E_____

c. P_____

d. V_____

e. A_____

9. Consider the following simple ***system model*** of a predator-prey system:



a. Identify the 4 basic components (building blocks) of system models

b. Convert the above drawing of a system model to a story, consistent with the model of a 2-species, predator-prey compartment model. Be as complete as you can.

10. Suppose the ***rate of change*** in the population of rabbits on Wofford's campus all during the month of March was observed to be more or less constant. How would you best describe the ***behavior*** you expect to observe in the population growth of rabbits on Wofford's campus?

11. Consider the following simple chart. Fill in the missing elements:

Change per unit time:	System behavior looks:
0	
	Linear
Linear in time	
Proportional to Population	

12. Suppose there are 5 rabbits. If you take away 2 rabbits, how many rabbits would you have?

13. In class we listed more than a dozen uses of computers in a scientific investigation (in addition to *taking over the tedious, repetitious workload of iterative processes*). Name at least 3 other uses you have learned about and give an example of how each has been used so far in at least one of the labs/explorations.

14.(non-graded) The course is now at "mid-term."

a. What is something new you have learned so far?

b. What is something that you would like to learn before the course is over?