

Name: \_\_\_\_\_

Collaborator(s): \_\_\_\_\_

*Please take your time and answer each question clearly and carefully. You may work with other students, but please be sure to write your own version of your solutions, in your own words, on this sheet. Please note your collaborators above. Collaboration is optional, but please spend your time constructively.*

1. Recall our population model  $P(t) = \frac{KP_0e^{rt}}{K+P_0(e^{rt}-1)}$ . In full sentences, using your own words, describe the following quantities. One is a function, one is a variable, and the rest are parameters – clearly indicate which is which in your description.

(a)  $P_0$

(b)  $P(t)$

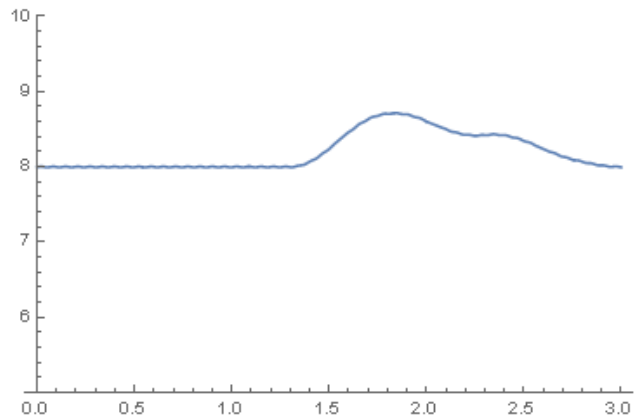
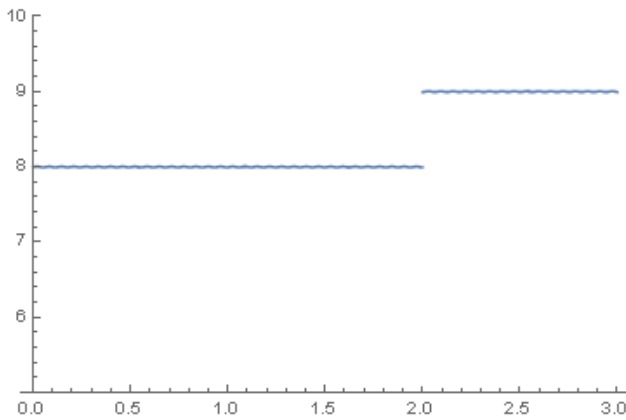
(c)  $r$

(d)  $K$

(e)  $t$

2. Which quantity in the previous question is equal to  $\lim_{t \rightarrow \infty} P(t)$ ? (You do not need to show the mathematical justification, just explain which one this is and why.)

3. The two graphs below show two different phenomena related to the weight of cat.



The two phenomena are as follows:

- My cat broke its leg and was fitted with a heavy metal rod to fix the bone.
- My cat had a mid-life crisis (life # 4 for cats) and gained some weight.

Which of these graphs shows which phenomenon? How do you know?

Which of these functions is continuous? One? Both? Neither?

*Note: This is fictional. Neither of these things happened to my cat.*