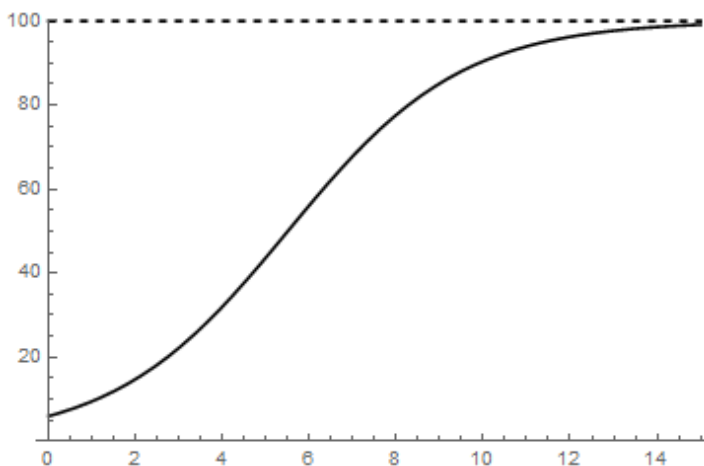


Name: _____

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. Consider our old population model, which had solutions that may look like this:

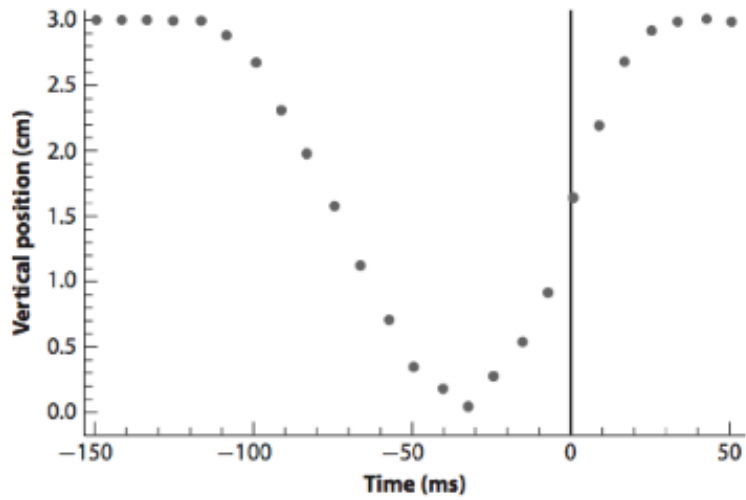


Based on this particular example graph, answer the following questions. Use sentences, and indicate the relevant locations on the graph. Explain how you know your answers.

- (a) When (what t value) is the rate of change $P'(t)$ largest?
- (b) When (what t value) is the rate of change $P'(t)$ smallest?
- (c) When is the relative rate of change $P'(t)/P(t)$ largest?
- (d) How do your answers to (a) and (c) compare?

TURN OVER

2. A veterinary scientist measures the position of a cat's tongue as it drinks water. The data are shown in the plot below.



Estimate the average speed of the tongue as it moves towards the water (downward), and then repeat your estimate for the movement away from the water (upward).