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(iii) The estimate using the average rate of change is the y -coordinate of a point on the secant line that passes through $(2, P(2))$ and $(8, P(8))$. Because the graph of P is concave up on the interval $(-\infty, \infty)$, the secant line is below the graph of P outside of the interval $(2, 8)$.

Therefore, the estimate using the average rate of change is less than the value of $P(t)$ for $t > 10$.

Part C

Select a point value to view scoring criteria, solutions, and/or examples to score the response.



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The student response includes this criterion.

- Answer with reason based on use of the displayed exponential $P(t)$ from Part A

Model Solution

The ecologist should have more confidence in using the model for $t = 6$ years. There is insufficient information to know how many years the exponential model can be extended above the maximum time provided in the data ($t = 8$) to make reasonable predictions. On the other hand, it is appropriate to use the regression model to estimate values at times that fall between the minimum time ($t = 2$) and the maximum time ($t = 8$) provided in the data.

Students who completed a class participated in a year-long study to see how much content from the class they retained over the following year. At the end of the class, students completed an initial test to determine the group's content knowledge. At that time ($t = 0$), the group of students achieved a score of 75 out of 100 points. For the next 12 months, the group was evaluated at the end of each month to track their retention of the content. After 3 months ($t = 3$), the group's score was 70.84 points.

The group's score can be modeled by the function R given by $R(t) = a + b \ln(t + 1)$, where $R(t)$ is the score, in points, for month t , and t is the number of months since the initial test.

8. Part A

- Use the given data to write two equations that can be used to find the values for constants a and b in the expression for $R(t)$.
- Find the values for a and b .

Part A

Select a point value to view scoring criteria, solutions, and/or examples to score the response.