### Lesson 10 Practice Problems

1. A store receives 2,000 decks of popular trading cards. The number of decks of cards is a function, , of the number of days, , since the shipment arrived. Here is a table showing some values of .

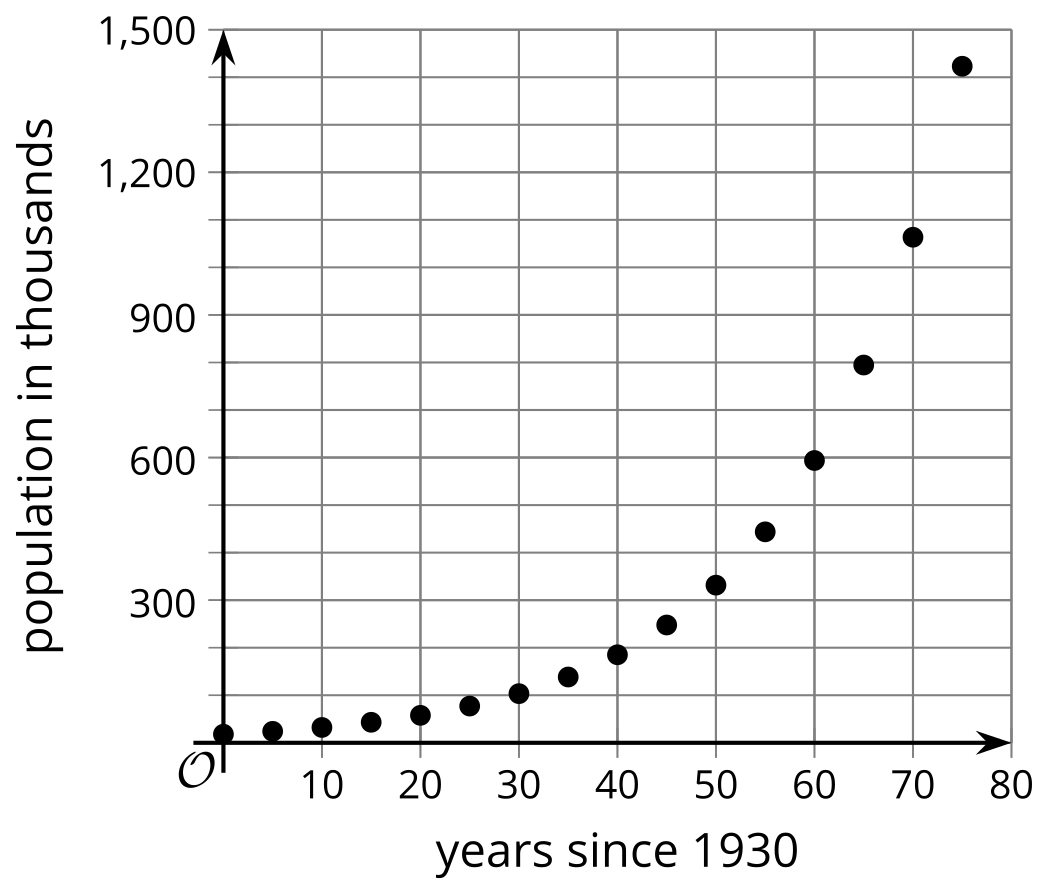
|  |  |
| --- | --- |
| * 0 | * 2,000 |
| * 5 | * 1,283 |
| * 10 | * 823 |
| * 15 | * 528 |
| * 20 | * 338 |

* Calculate the average rate of change for the following intervals:
  1. day 0 to day 5
  2. day 15 to day 20

1. A study was conducted to analyze the effects on deer population in a particular area. Let be an exponential function that gives the population of deer  years after the study began.

* If  and the population is increasing, select **all** statements that must be true.
  1. The average rate of change from year 0 to year 5 is less than the average rate of change from year 10 to year 15.
  2. The average rate of change from year 0 to year 5 is greater than the average rate of change from year 10 to year 15.

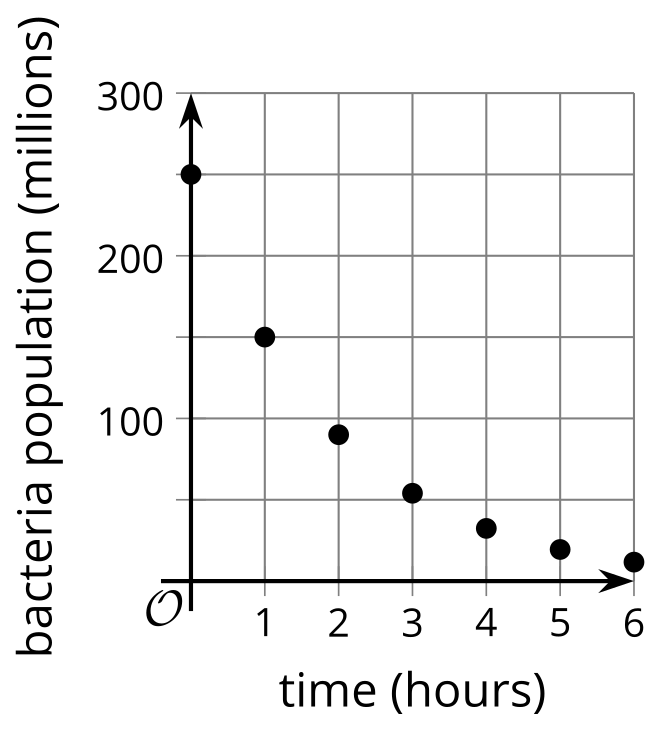
1. Function models the population, in thousands, of a city years after 1930.

* The average rate of change of from to is approximately 14 thousand people per year.
* Is this value a good way to describe the population change of the city over that time period? Explain or show your reasoning.
* 

1. The function, , gives the number of copies a book has sold weeks after it was published. The equation  defines this function.

* Select **all** domains for which the average rate of change could be a good measure for the number of books sold.

1. The graph shows a bacteria population decreasing exponentially over time.

* The equation  gives the size of a second population of bacteria, where is the number of hours since it was measured at 100 million.
* Which bacterial population decays more quickly? Explain how you know.
* 
* ​​​​​​
* (From Unit 5, Lesson 6.)

1. *Technology required.*A moth population, , is modeled by the equation , where is the number of weeks since the population was first measured.
   1. What was the moth population when it was first measured?
   2. What was the moth population after 1 week? What about 1.5 weeks?
   3. Use technology to graph the population and find out when it falls below 10,000.

* (From Unit 5, Lesson 9.)

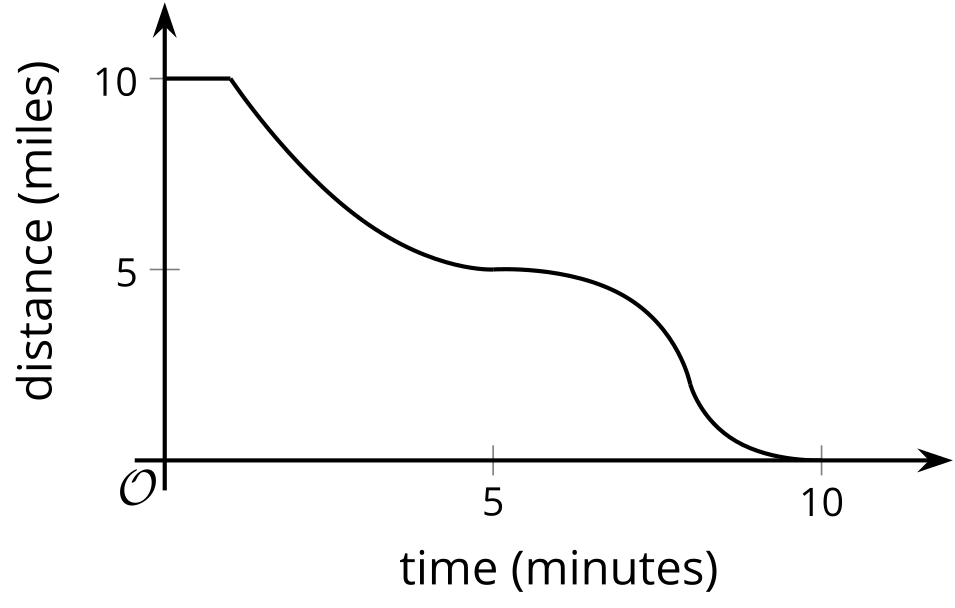
1. Give a value for that would indicate that a line of best fit has a positive slope and models the data well.

* (From Unit 3, Lesson 7.)

1. The size of a district and the number of parks in it have a weak positive relationship.

* Explain what it means to have a weak positive relationship in this context.
* (From Unit 3, Lesson 8.)

1. Here is a graph of Han’s distance from home as he drives.

* Identify the intercepts of the graph and explain what they mean in terms of Han’s distance from home.
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* (From Unit 4, Lesson 6.)



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