

Exponentials Homework

Write an exponential growth function to model each situation. Then find the value of the function after the given amount of time.

1. Annual sales for a fast food restaurant are \$650,000 and are increasing at a rate of 4% per year; 5 years
2. The population of a school is 800 students and is increasing at a rate of 2% per year; 6 years
3. During a certain period of time, about 70 northern sea otters had an annual growth rate of 18%; 4 years

Write an exponential decay function to model each situation. Then find the value of the function after the given amount of time.

4. The population of a town is 2500 and is decreasing at a rate of 3% per year; 5 years
5. The value of a company's equipment is \$25,000 and decreases at a rate of 15% per year; 8 years

6. A certain type of lily plant is growing in a pond in such a way that the number of plants is growing exponentially. The number of plants, N , in the pond at time t is modeled by the function $N(t) = ab^t$, where a and b are constants and t is measured in months. The table shows two values of the function.

t	$N(t)$
0	150
1	450

Which equation can be used to find the number of plants in the pond at time t ?

Ⓐ $N(t) = 150(1)^t$
 Ⓑ $N(t) = 450(1)^t$
 Ⓒ $N(t) = 150(3)^t$
 Ⓓ $N(t) = 450(3)^t$

7. **Elephant Population Estimates—Namibia**

Combined estimates for Etosha National Park and the Northwestern Population

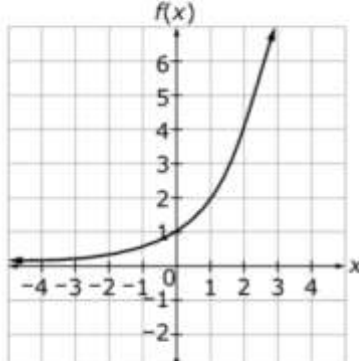
Year	Base Year	Estimated Number of Elephants
1998	3	3,218
2000	5	3,628
2002	7	3,721
2004	9	3,571

The elephant population in northwestern Namibia and Etosha National Park can be predicted by the expression $2,649(1.045)^b$, where b is the number of years since 1995.

What does the value 2,649 represent?

Ⓐ the predicted increase in the number of elephants in the region each year
 Ⓑ the predicted number of elephants in the region in 1995
 Ⓒ the year when the elephant population is predicted to stop increasing
 Ⓓ the percentage the elephant population is predicted to increase each year

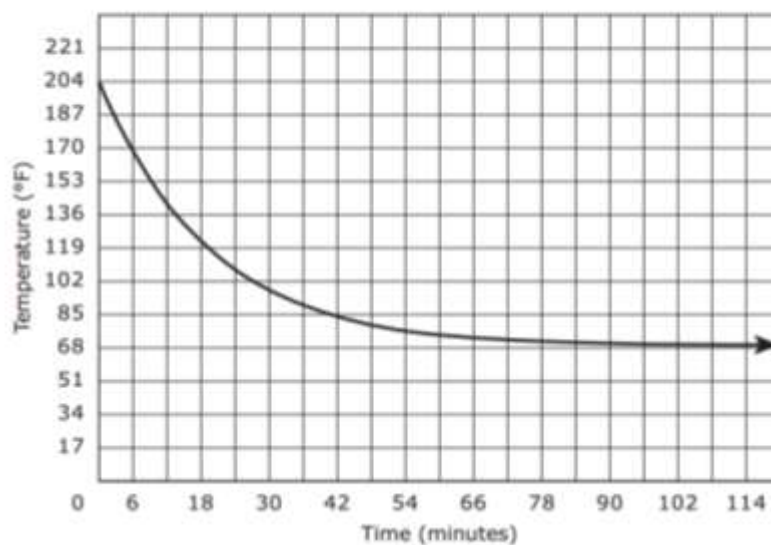
8. The graph of an exponential function f passes through $(0, 1)$ and $(2, 4)$, as shown.



What is the value of $f(6)$?

9.

The graph represents the temperature, in degrees Fahrenheit ($^{\circ}\text{F}$), of tea for the first 120 minutes after it was poured into a cup.



Part A

Based on the graph, what was the temperature of the tea when it was first poured into the cup?

- Ⓐ 68°
- Ⓑ 114°
- Ⓒ 136°
- Ⓓ 204°

Part B

Based on the graph, as the number of minutes increased, what temperature did the tea approach?

- Ⓐ 68°
- Ⓑ 114°
- Ⓒ 136°
- Ⓓ 204°