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

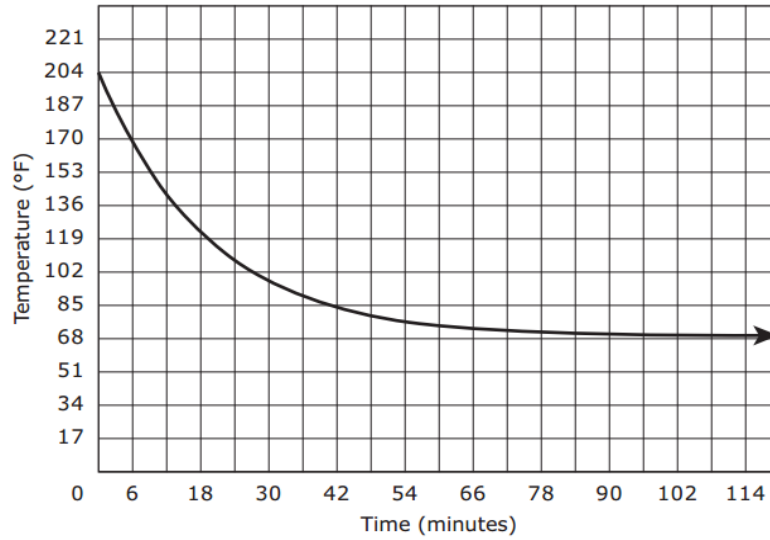Ⓓ the percentage the elephant population is predicted to increase each year

8.

The graph of an exponential function f passes through (0, 1) and (2, 4), as shown.
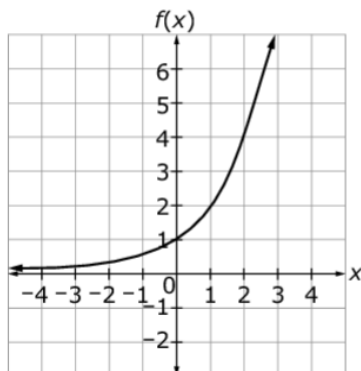
What is the value of $f(6)$?

9.

The graph represents the temperature, in degrees Fahrenheit (°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°