

F.LE.A.2: Modeling Exponential Functions 1

- 1 The country of Benin in West Africa has a population of 9.05 million people. The population is growing at a rate of 3.1% each year. Which function can be used to find the population 7 years from now?

- 1) $f(t) = (9.05 \times 10^6)(1 - 0.31)^7$
- 2) $f(t) = (9.05 \times 10^6)(1 + 0.31)^7$
- 3) $f(t) = (9.05 \times 10^6)(1 + 0.031)^7$
- 4) $f(t) = (9.05 \times 10^6)(1 - 0.031)^7$

- 2 The table below shows the temperature, $T(m)$, of a cup of hot chocolate that is allowed to chill over several minutes, m .

Time, m (minutes)	0	2	4	6	8
Temperature, $T(m)$ ($^{\circ}\text{F}$)	150	108	78	56	41

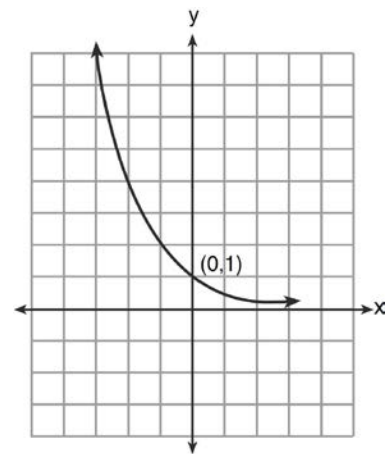
Which expression best fits the data for $T(m)$?

- 1) $150(0.85)^m$
- 2) $150(1.15)^m$
- 3) $150(0.85)^{m-1}$
- 4) $150(1.15)^{m-1}$

- 3 The Ebola virus has an infection rate of 11% per day as compared to the SARS virus, which has a rate of 4% per day. If there were one case of Ebola and 30 cases of SARS initially reported to authorities and cases are reported each day, which statement is true?

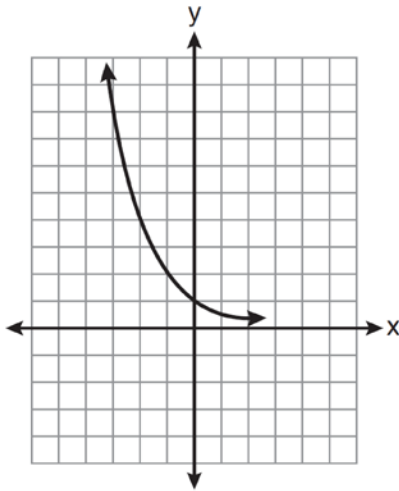
- 1) At day 10 and day 53 there are more Ebola cases.
- 2) At day 10 and day 53 there are more SARS cases.
- 3) At day 10 there are more SARS cases, but at day 53 there are more Ebola cases.
- 4) At day 10 there are more Ebola cases, but at day 53 there are more SARS cases.

- 4 What is the equation of the graph shown below?



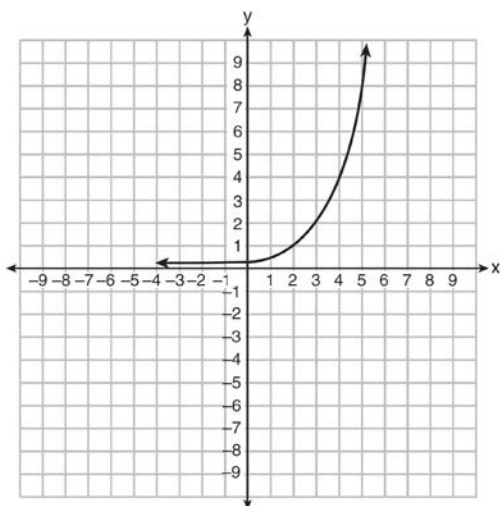
- 1) $y = 2^x$
- 2) $y = 2^{-x}$
- 3) $x = 2^y$
- 4) $x = 2^{-y}$

5 Which equation is represented by the graph below?



- 1) $y = 5^x$
- 2) $y = 0.5^x$
- 3) $y = 5^{-x}$
- 4) $y = 0.5^{-x}$

6 Write an exponential equation for the graph shown below.



Explain how you determined the equation.

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Answer Section

1 ANS: 3 REF: 081507ai

2 ANS: 1 REF: 081617ai

3 ANS: 3

$$E(10) = 1(1.11)^{10} \approx 3 \quad S(10) = 30(1.04)^{10} \approx 44$$

$$E(53) = 1(1.11)^{53} \approx 252 \quad S(53) = 30(1.04)^{53} \approx 239$$

REF: 081721ai

4 ANS: 2 REF: 011301a2

5 ANS: 2 REF: 061108a2

6 ANS:

$y = 0.25(2)^x$. I inputted the four integral values from the graph into my graphing calculator and determined the exponential regression equation.

REF: 011532ai