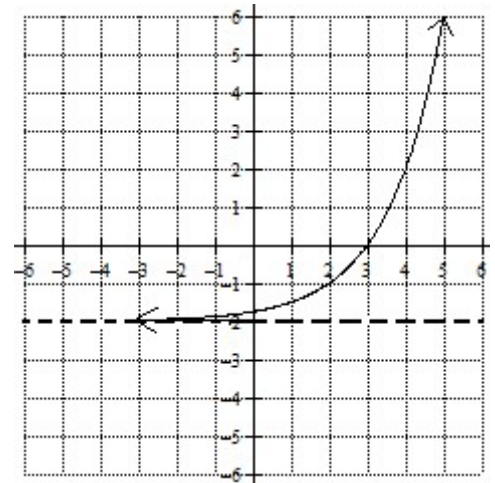


Homework 7.6

The graph of an exponential function of the form $g(x) = a \cdot b^{c(x-h)} + k$ is graphed to the right. Use the graph to answer the following questions.



1. Is $g(x)$ an exponential growth or decay function? Give a reason for your answer.

$g(x)$ is increasing

$\therefore g(x)$ is exponential growth

2. Describe the left and right end behavior of the function, using the terms bounded or unbounded.

$\lim_{x \rightarrow -\infty} g(x) = -2$ \therefore As x goes left it decreases with bound at $y = -2$

$\lim_{x \rightarrow \infty} g(x) = \infty$ \therefore As x goes right it increases without bound

3. Identify the domain and range of the function.

Domain $(-\infty, \infty)$

Range $(-2, \infty)$

4. What is the equation of the horizontal asymptote?

$$y = -2$$

5. What can be concluded about the value of a in the equation of $g(x)$? Give a reason for your answer.

$g(x)$ is above the H.A.
 $\therefore a > 0$

6. What can be concluded about the value of c in the equation of $g(x)$? Give a reason for your answer.

$\lim_{x \rightarrow \infty} g(x) = \infty$
 $\therefore c > 0$

7. What can be concluded about the value of k in the equation of $g(x)$? Give a reason for your answer.

$g(x)$ has a horizontal asymptote at $y = -2$
 $\therefore k = -2$

x	-9	-5	-1	1	3	5	9
$G(x)$	-510	-30	0	1.5	1.875	1.969	1.998

The table of values for an exponential function of the form $G(x) = a \cdot b^{c(x-h)} + k$ is shown above. Use the graph to answer the following questions.

8. Is $G(x)$ an exponential growth or decay function? Give a reason for your answer.

$G(x)$ is increasing

$\therefore G(x)$ is exponential growth.

9. Describe the left and right end behavior of the function, using the terms bounded or unbounded.

$\lim_{x \rightarrow -\infty} g(x) = -\infty$ \therefore As x goes left it decreases without bound

$\lim_{x \rightarrow \infty} g(x) = 2$ \therefore As x goes right it increases with bound at $y=2$

10. Identify the domain and range of the function.

Domain $(-\infty, \infty)$

Range $(-\infty, 2)$

11. What is the equation of the horizontal asymptote? Give a numerical reason for your answer.

$\lim_{x \rightarrow \infty} g(x) = 2$ $\therefore g(x)$ has a HA at $y=2$

12. What can be concluded about the value of a in the equation of $G(x)$? Give a reason for your answer.

The y -values of $g(x) < 2$.
 $\therefore a < 0$

13. What can be concluded about the value of c in the equation of $G(x)$? Give a reason for your answer.

$\lim_{x \rightarrow \infty} g(x) = 2$

$\therefore c < 0$

14. What can be concluded about the value of k in the equation of $G(x)$? Give a reason for your answer.

$g(x)$ has a horizontal asymptote at $y=2$

$\therefore k = 2$