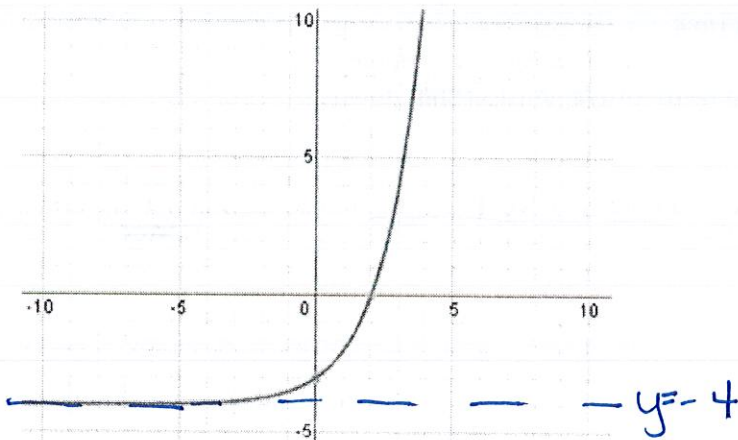


Practice Test Questions
Graphing and Transformations

1.



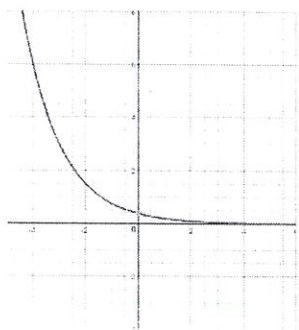
Determine the function represented by the graph above.

- a. $f(x) = 2^x - 4$
- b. $f(x) = 2^{x-4}$
- c. $f(x) = 2^x$
- d. $f(x) = \left(\frac{1}{2}\right)^x$

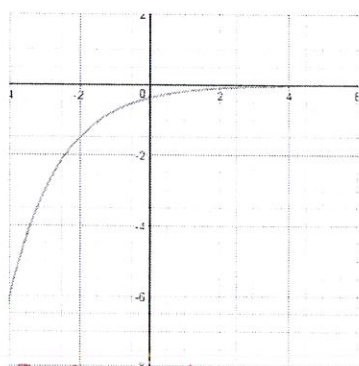
Decay $b < 1$

2. Graph the function $f(x) = 3\left(\frac{1}{2}\right)^{x+3} + 0 \rightarrow$ Asymptote

a.

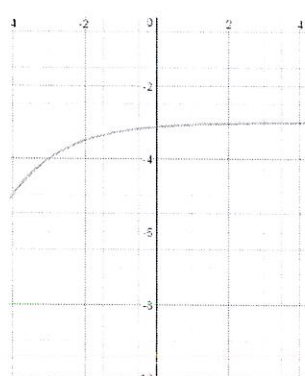


~~X~~

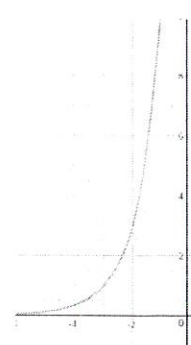


~~X~~

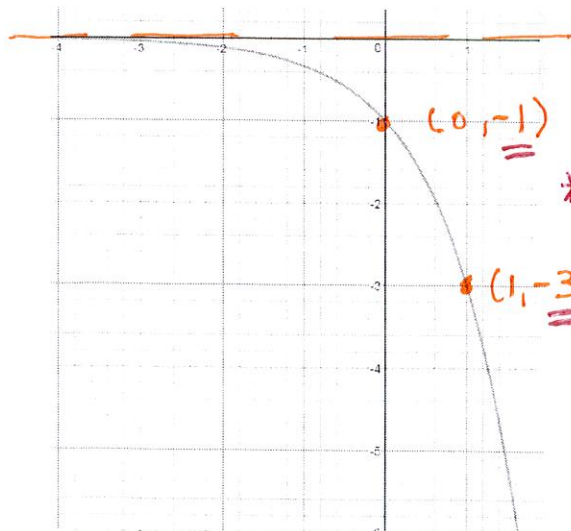
Reflected



~~X~~



3.

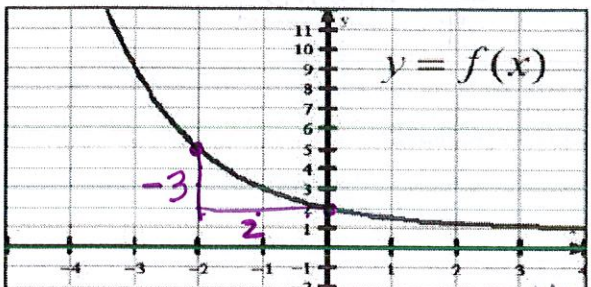


Determine the function represented by the graph above.

- a. $f(x) = -2^x - 4$
- b. $f(x) = -3^x$
- c. $f(x) = -2^x$
- d. $f(x) = \left(\frac{1}{2}\right)^x$

Practice Test Questions
Characteristics of Exponential Functions

1.



What is the average rate of change for the function $f(x)$ on the interval $[-2, 0]$?

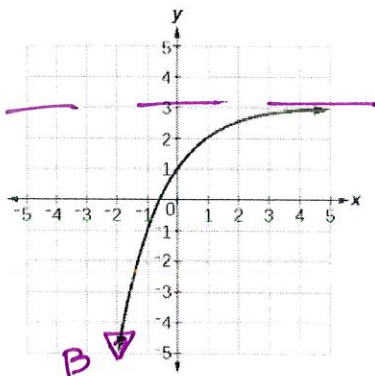
- a. -2
- b. -3
- c. -6
- d. -1.5

Slope: $\frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 5}{0 - (-2)} = -\frac{3}{2}$ $-2 \leq x \leq 0$

2. What is the asymptote of the function $f(x) = \frac{1}{2}(2)^x - 4$?

- a. $x = .5$
- b. $y = 2$
- c. $x = 4$
- d. $y = -4$

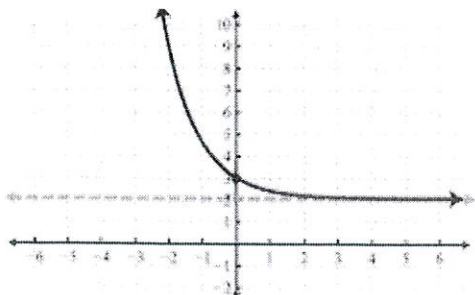
3.



State the range of the function.

- a. $(-\infty, 3)$
- b. $(3, -\infty)$
- c. $(3, \infty)$
- d. $(-\infty, \infty)$

4.



State the range of the function.

- a. $(2, \infty)$
- b. $(2, -\infty)$
- c. $(\infty, 2)$
- d. $(-\infty, \infty)$

Geometric Sequences

$$a_n = a_1(r)^{n-1}$$

Write an explicit rule for the following sequences (questions 1 – 3):

1) 4, 16, 64, 256, ...

$$r = 4$$

$$a_1 = 4$$

A) $a_n = 16 \cdot \left(\frac{1}{4}\right)^{n-1}$

B) $a_n = 15 \cdot \left(\frac{1}{4}\right)^{n-1}$

C) $a_n = 4 \cdot 4^{n-1}$

D) $a_n = 16 \cdot 4^{n-1}$

2) 4, 20, 100, 500, ...

$$a_1 = 4$$

A) $a_n = -12 \cdot (-3)^{n-1}$

B) $a_n = 12 \cdot 3^{n-1}$

C) $a_n = 4 \cdot 5^{n-1}$

D) $a_n = 4 \cdot (-3)^{n-1}$

3) 3, -9, 27, -81, ...

$$a_1 = 3$$

$$r = -3$$

A) $a_n = 3 \cdot (-3)^{n-1}$

B) $a_n = 3 \cdot (-5)^{n-1}$

C) $a_n = -3 \cdot 3^{n-1}$

D) $a_n = 3 \cdot 2^{n-1}$

Given the recursive formula, write an explicit formula for the same sequence (questions 4-6)

4. $a_n = a_{n-1} \cdot (-5)$
 $a_1 = 4$

A) $a_n = -4 \cdot \left(\frac{1}{5}\right)^{n-1}$

B) $a_n = -4 \cdot 5^{n-1}$

C) $a_n = 4 \cdot \left(-\frac{1}{5}\right)^{n-1}$

D) $a_n = 4 \cdot (-5)^{n-1}$

5. $a_n = a_{n-1} \cdot (-5)$
 $a_1 = -4$

~~A) $a_n = 21 \cdot \left(-\frac{1}{5}\right)^{n-1}$~~

B) $a_n = -4 \cdot (-5)^{n-1}$

C) $a_n = 21 \cdot (-5)^{n-1}$

D) $a_n = 20 \cdot (-5)^{n-1}$

6. $a_n = a_{n-1} \cdot 4$
 $a_1 = 4$

A) $a_n = 3 \cdot 4^{n-1}$

B) $a_n = 4 \cdot \left(-\frac{3}{5}\right)^{n-1}$

C) $a_n = 4 \cdot 4^{n-1}$

D) $a_n = 4 \cdot \left(\frac{1}{4}\right)^{n-1}$

Practice Test Questions

Applications

1. A limousine costs \$80,000 new, but depreciates at a rate of 30% per year. What is the value of the limousine after 7 years?

- a. \$50,1988.14
- b. \$6,588.34
- c. \$17.50
- d. \$3,282,709.39

$$80000(1 - .30)^t$$

2. A culture of bacteria triples every hour. If there are 600 bacteria at the beginning, how many bacteria will there be after 10 hours?

- a. 35,429,400
- b. 629,145,600
- c. 614,400
- d. .0101361053

$$y = a(b)^x$$

$$y = 600(3)^x$$

3. Given the function $f(x) = 650(.36)^x$, determine if this function models exponential growth or decay and identify the growth and decay rate.

- a. Decay, 64%
- b. Growth, 64%
- c. Decay, 36%
- d. Growth, 36%

factor
↳ difference from 100%

4. The value (in millions of dollars) of a large company is modeled by $f(x) = 250(1.05)^x$. What is the projected annual percent growth and what is the initial value?

- a. 10.5%; \$250 million
- b. 2.50%; \$105 million
- c. 250%; \$5 million
- d. 5%; \$250 million

5. The population of a small town has established a growth rate of 5% per year. If the current population is 4000, and the growth rate remains steady, how many years will it take for the population to first go over 5000?

- a. 3 4631
- b. 4 4862
- c. 5 5105
- d. 6

$$4000(1 + .05)^x$$

6. The population of a Russian Village is currently 600. Based on the observed growth of the population in the past years it is estimated that after 1 year the population will be 720. Similarly, it is estimated that after 2 and 3 years, the population of the village will be 864, and 1,036 respectively. Which function describes the relationship between year and the village population?

- a. $f(x) = 700(1.2)^x$
- b. $f(x) = 600(1.2)^x$
- c. $f(x) = 600(1.02)^x$
- d. $f(x) = 600(1.2)^{x-1}$
initial amt

* $y = a(b)^x$
* Make a table

years	population
0	600
1	720
2	864
3	1036