

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the function value.

1) Let $f(x) = 41 - x$. Find $f(3)$.

A) -8

B) 16

C) $\frac{1}{8}$

D) $\frac{1}{16}$

Answer: D

Objective: (3.1) Evaluate Exponential Function

Solve the problem.

2) The population of a small country increases according to the function $B = 1,300,000e^{0.05t}$, where t is measured in years. How many people will the country have after 8 years?

A) 1,191,178

B) 517,322

C) 1,939,372

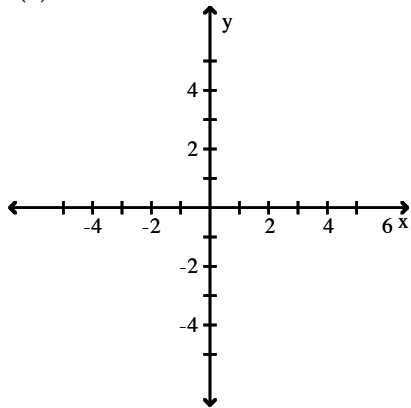
D) 3,265,452

Answer: C

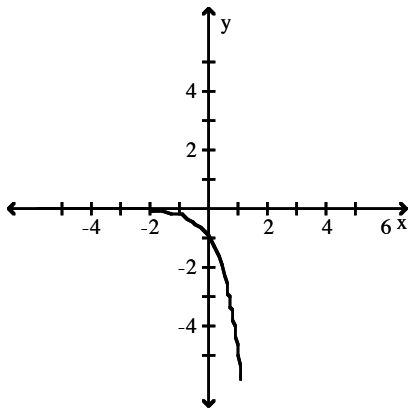
Objective: (3.1) Solve Apps: Evaluate Exponential Function

Graph the function.

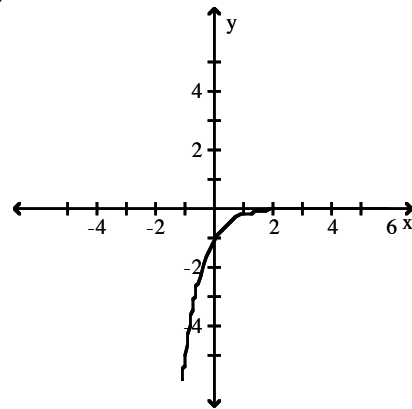
3) $f(x) = 5^{-x}$



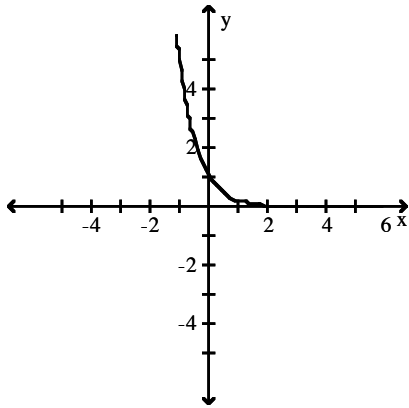
A)



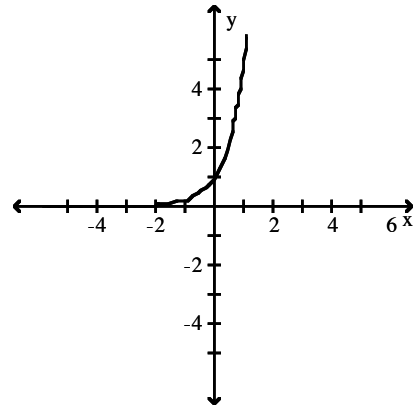
B)



C)



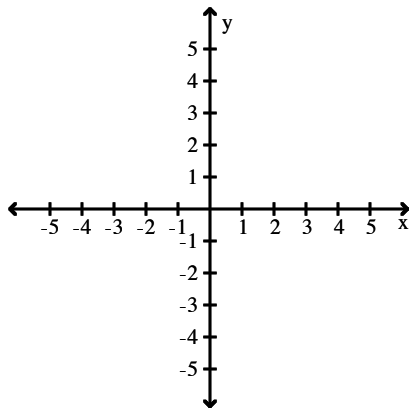
D)



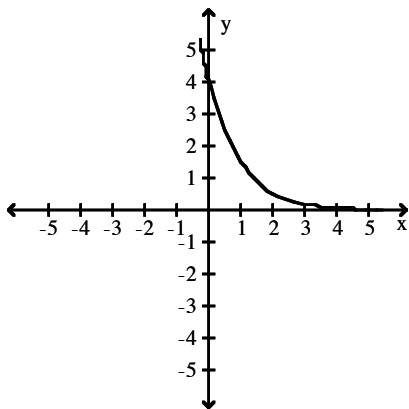
Answer: C

Objective: (3.1) Graph Exponential Function

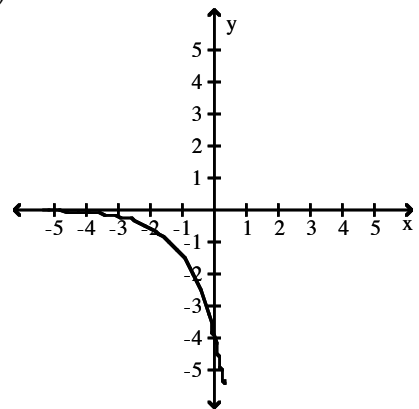
4) $f(x) = 4e^{-x}$



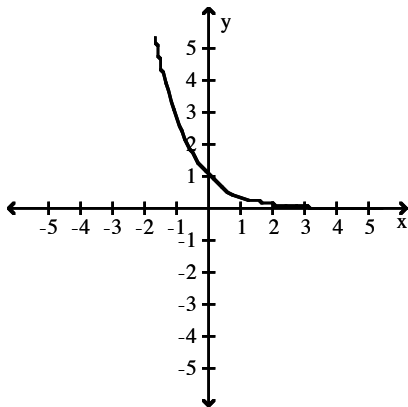
A)



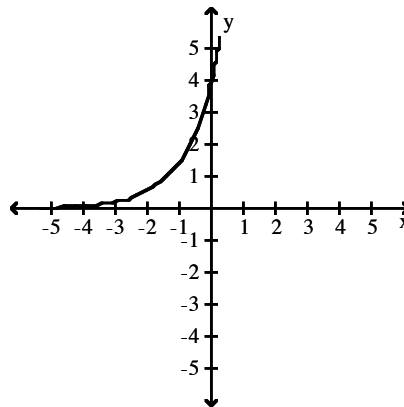
B)



C)



D)



Answer: A

Objective: (3.1) Graph Exponential Function

Solve the problem.

- 5) A computer is purchased for \$4800. Its value each year is about 78% of the value the preceding year. Its value, in dollars, after t years is given by the exponential function $V(t) = 4800(0.78)^t$. Find the value of the computer after 7 years.

A) \$657.65

B) \$512.97

C) \$26,208.00

D) \$843.15

Answer: D

Objective: (3.1) Solve Apps: Evaluate Exponential Function

- 6) The half-life of a certain radioactive substance is 19 years. Suppose that at time $t = 0$, there are 24 g of the substance. Then after t years, the number of grams of the substance remaining will be:

$$N(t) = 24 \left(\frac{1}{2} \right)^{t/38}$$

How many grams of the substance will remain after 171 years?

A) 0.53 g

B) 0.27 g

C) 1.06 g

D) 0.13 g

Answer: C

Objective: (3.1) Solve Apps: Evaluate Exponential Function

Find the function value.

- 7) Let $f(x) = e^{3x}$. Find $f(-0.09)$, rounded to four decimal places.

A) 0.7634

B) -0.8279

C) 0.8279

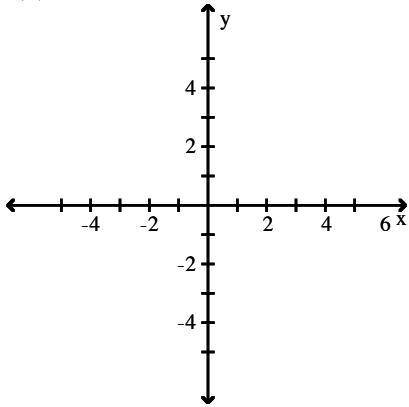
D) -0.7634

Answer: A

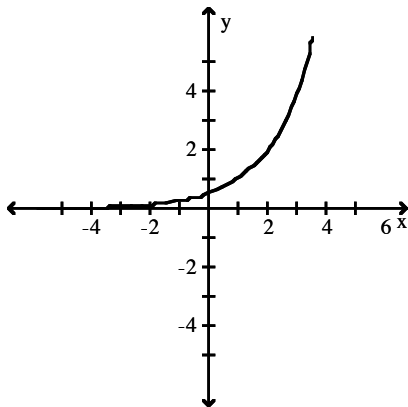
Objective: (3.1) Evaluate Exponential Function

Graph the function.

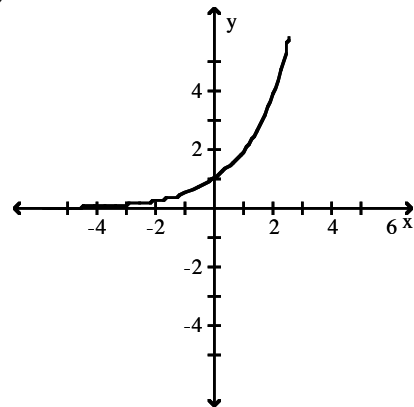
8) $f(x) = 2^{(x-1)}$



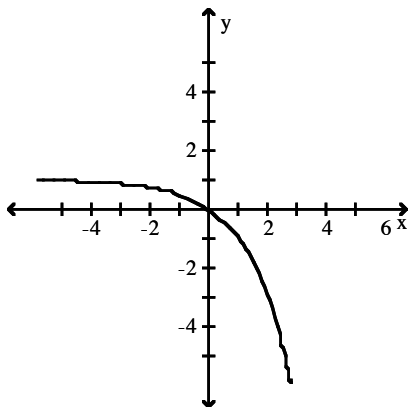
A)



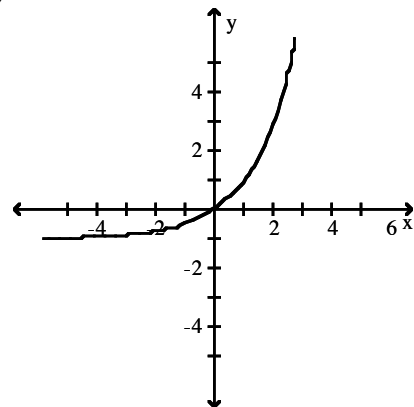
B)



C)



D)



Answer: A

Objective: (3.1) Graph Exponential Function

Solve the problem.

9) The growth in the population of a certain rodent at a dump site fits the exponential function

$A(t) = 170e^{0.028t}$, where t is the number of years since 1984. Estimate the population in the year 2000.

A) 175

B) 266

C) 274

D) 133

Answer: B

Objective: (3.1) Solve Apps: Evaluate Exponential Function

Evaluate the logarithm, if possible. Round the answer to four decimal places.

- 10) $\log 245$
A) 2.3892 B) 2.3874 C) 2.3909 D) 5.5013

Answer: A

Objective: (3.2) Tech: Approximate Logarithm

Solve the problem.

- 11) The sales of a new product (in items per month) can be approximated by $S(x) = 225 + 500 \log(3t + 1)$, where t represents the number of months after the item first becomes available. Find the number of items sold per month 3 months after the item first becomes available.
A) 5225 items per month B) 10,225 items per month
C) 1225 items per month D) 725 items per month

Answer: D

Objective: (3.2) Solve Apps: Logarithmic Functions

- 12) Coyotes are one of the few species of North American animals with an expanding range. The future population of coyotes in a region of Mississippi can be modeled by the equation $P = 41 + 19 \ln(14t + 1)$, where t is time in years. Use the equation to determine when the population will reach 170.
A) 439,891.5 years B) 63.5 years C) 63.7 years D) 63.4 years

Answer: D

Objective: (3.2) Solve Apps: Logarithmic Functions

Provide an appropriate response.

- 13) What is the range of the function $y = \log_4 x$?
A) $(0, \infty)$ B) $(-\infty, \infty)$ C) $(4, \infty)$ D) $[0, \infty)$

Answer: B

Objective: (3.2) *Know Concepts: Logarithmic Functions

Solve the problem.

- 14) A certain noise has an intensity I of 8.17×10^{-5} . Given that decibel level L is related to intensity by $L = 10 \log \left(\frac{I}{I_0} \right)$, where I_0 is 10^{-12} , determine the decibel level of the noise. Round your answer to the nearest decibel.
A) 182 decibels B) 79 decibels C) 69 decibels D) 8 decibels

Answer: B

Objective: (3.2) Solve Apps: Decibel Scale

Find the value of the logarithm without using a calculator.

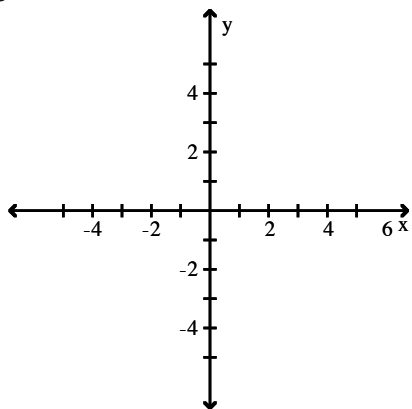
- 15) $\log_6 \frac{1}{36}$
A) -6 B) 2 C) -2 D) 6

Answer: C

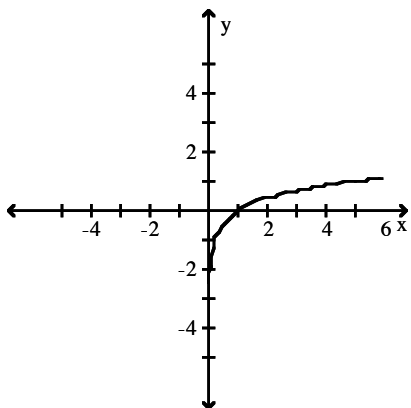
Objective: (3.2) Evaluate Logarithm

Graph the function.

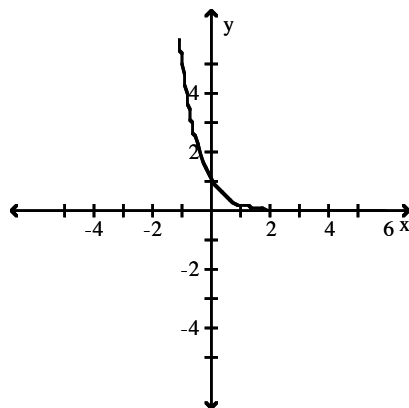
16) $y = \log_5 x$



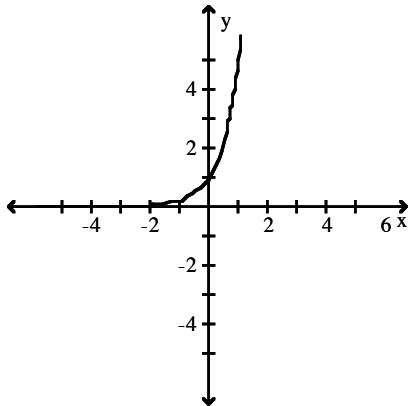
A)



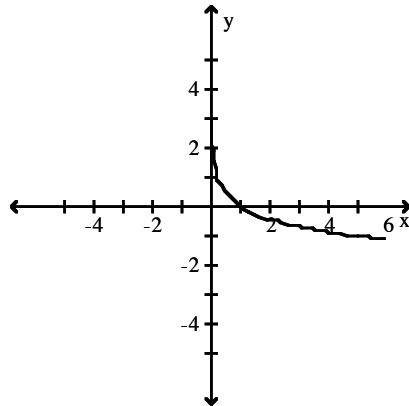
B)



C)



D)



Answer: A

Objective: (3.2) Graph Logarithmic Function

Write the logarithmic equation in exponential form.

17) $y = \log(12x)$

A) $y^{10} = 12x$

B) $10^y = 12x$

C) $12x^y = 10$

D) $10^{12x} = y$

Answer: B

Objective: (3.2) Write Logarithmic Equation in Exponential Form

Find the value of the logarithm without using a calculator.

18) $\log_3 \sqrt{3}$

A) -2

B) $\frac{1}{2}$

C) $-\frac{1}{2}$

D) 2

Answer: B

Objective: (3.2) Evaluate Logarithm

Provide an appropriate response.

19) What is the range of the function $y = \left(\frac{1}{4}\right)^x$?

A) $(-\infty, 0)$

B) $[0, \infty)$

C) $(0, \infty)$

D) $(-\infty, \infty)$

Answer: C

Objective: (3.2) *Know Concepts: Logarithmic Functions

Solve the equation.

20) $\log_5 125 = x$

A) 625

B) 3

C) 130

D) 25

Answer: B

Objective: (3.2) Solve Logarithmic Equation