



2023-2024

# 5.1 Exponential Functions

SCORE: /

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

Approximate the value using a calculator. Express answer rounded to three decimal places.

1.  $5^{2.71}$

2.  $e^{3.14}$

3.  $2.1^3$

The graph of an exponential function is given. Match the graph to one of the following functions. Use transformations to find the answers. Do not use a calculator.

a)  $y = 3^x$

b)  $y = 3^{-x}$

c)  $y = -3^x$

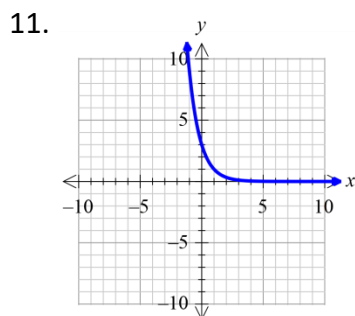
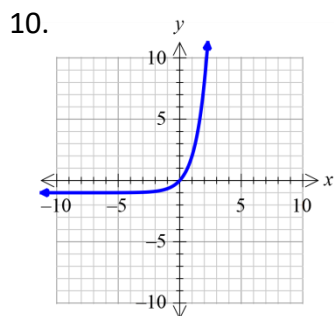
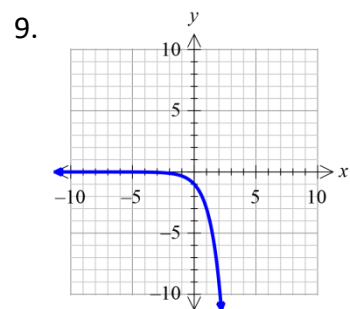
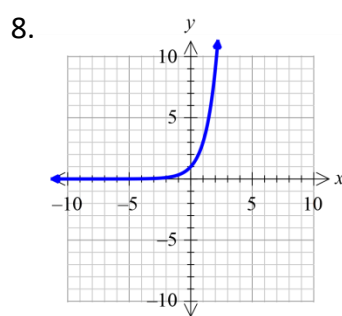
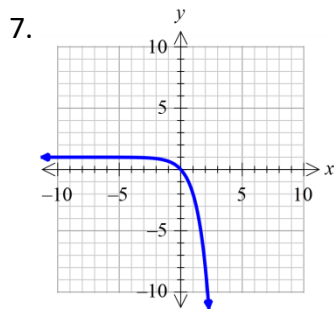
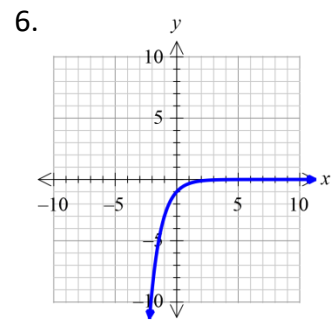
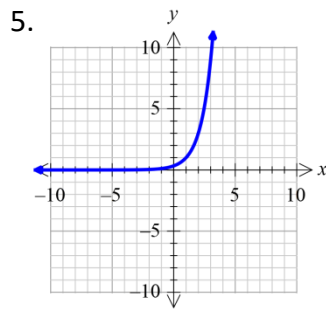
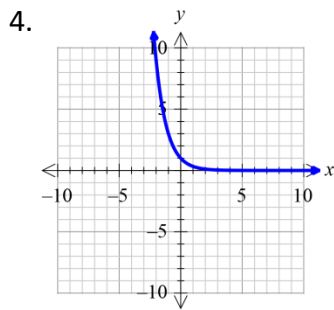
d)  $y = -3^{-x}$

e)  $y = 3^x - 1$

f)  $y = 3^{x-1}$

g)  $y = 3^{1-x}$

h)  $y = 1 - 3^x$



Use transformations and 3 key points to graph each function. Determine the domain, range, and horizontal asymptote of each function. Use a table! No Graphing Calculator! Show work!

12.  $f(x) = 2^x + 1$

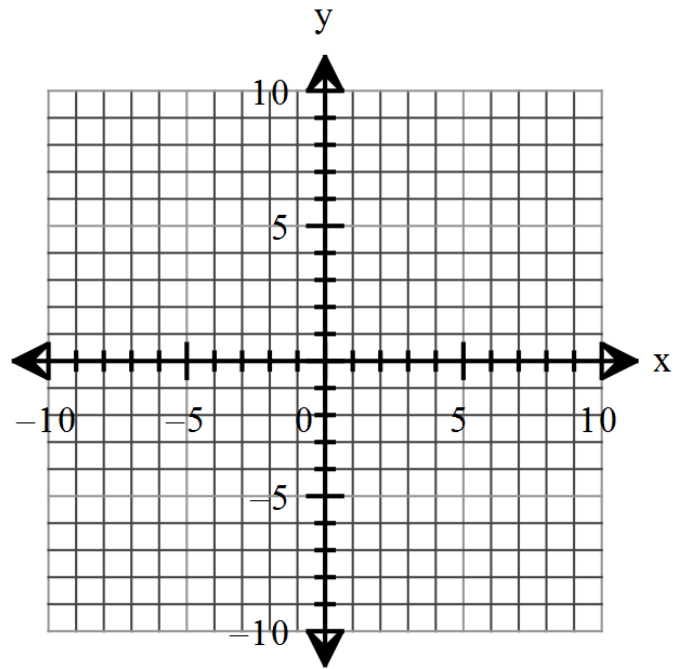
Domain: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

Key points and transformations:

$x$	$f(x)$

$x$	$f(x)$



Range: \_\_\_\_\_

13.  $f(x) = -3^{x-1}$

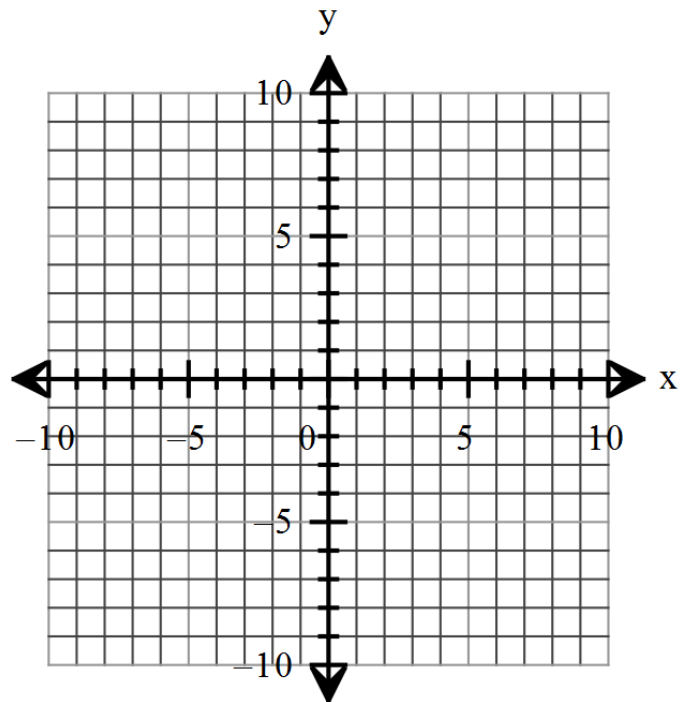
Domain: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

Key points and transformations:

$x$	$f(x)$

$x$	$f(x)$



Range: \_\_\_\_\_

14.  $f(x) = 3^{x/2} + 2$

Domain: \_\_\_\_\_

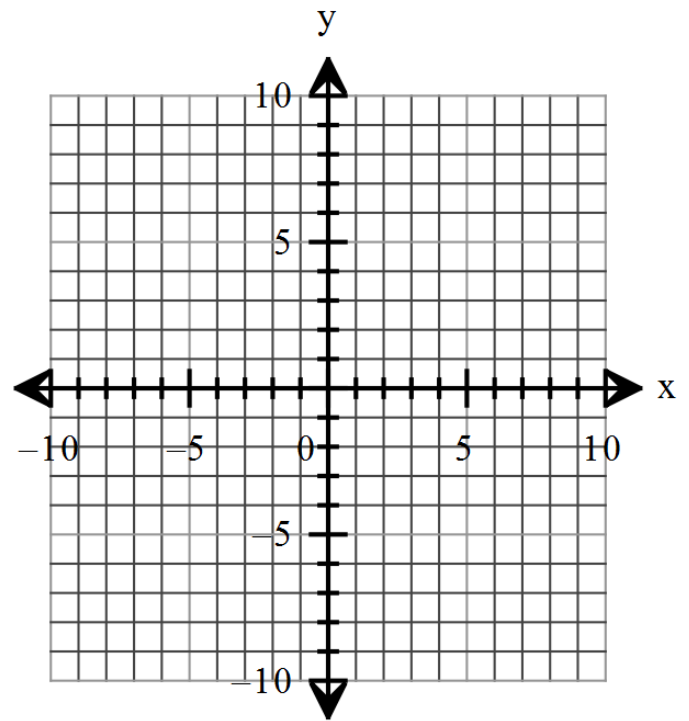
Asymptotes: \_\_\_\_\_

Key points and transformations:

$x$	$f(x)$

$x$	$f(x)$

Range: \_\_\_\_\_



15.  $f(x) = 2^{-x} - 3$

Domain: \_\_\_\_\_

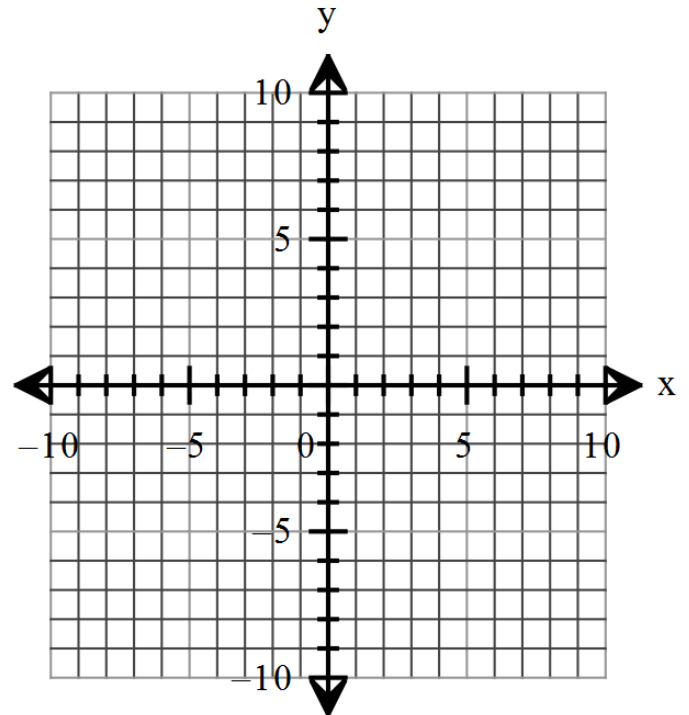
Asymptotes: \_\_\_\_\_

Key points and transformations:

$x$	$f(x)$

$x$	$f(x)$

Range: \_\_\_\_\_



Solve each equation using the one-to-one property for exponents. Show work! You may need to factor to solve.

16.  $7^x = 7^3$

17.  $\left(\frac{1}{4}\right)^x = \frac{1}{64}$

18.  $3^{-x} = 81$

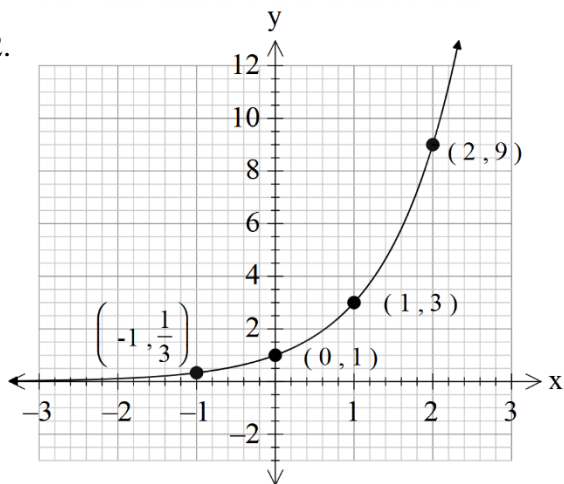
19.  $4^{x^2} = 2^x$

20.  $9^{-x+15} = 27^x$

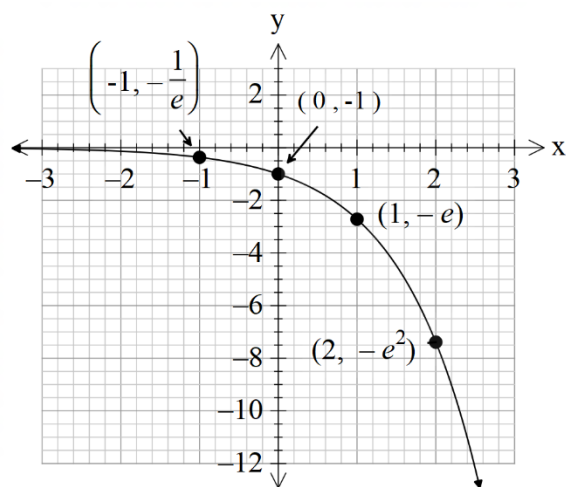
21.  $4^x \cdot 2^{x^2} = 16^2$

Determine the exponential function whose graph is given.

22.



23.



Find the amount that results from each investment. Round answers to the nearest cent.

Compounded Interest:  $A = P\left(1 + \frac{r}{n}\right)^{nt}$  P = Initial amount or Principle, r = rate, n = number of times in a year, t = time in years, A = the total amount with interest

24. \$100 invested at 4% compounded quarterly after a period of 2 years.

25. \$1000 invested at 11% compounded monthly after a period of 2 years.

Find the principal needed now to get each amount; that is, find the present value. Round answers to the nearest cent.

26. To get \$100 after 2 years at 6% compounded monthly

27. To get \$300 after 4 years at 3% compounded daily

### Review Exercises

Find the domain of the given functions. Write answers in interval notation. Show work!

28.  $f(x) = \frac{\sqrt{x+2}}{(x-3)(x+5)}$

29.  $f(x) = \sqrt{-2x+7}$