Name: _____ **Class:** _____ **Date:** _____ **ID: X**

Alg 1 Topic 6 Test Practice

____ 1. Write the exponential expression $3x^{\frac{3}{8}}$ in radical form.

a. $3\sqrt[8]{x^3}$ b. $\sqrt[8]{3x^3}$ c. $3\sqrt[3]{x^8}$ d. $3^{\frac{3}{8}}\sqrt[8]{x^3}$

____ 2. Write the radical expression $\frac{8}{\sqrt[7]{x^{15}}}$ in exponential form.

a. $8x^{-\frac{7}{15}}$ b. $8x^{\frac{15}{7}}$ c. $8x^{-\frac{15}{7}}$ d. $8x^{\frac{7}{15}}$

____ 3. Write the radical expression $\sqrt[7]{4^{-10}}$ using rational exponents.

a. $4^{\frac{1}{7}}$ c. $4^{-\frac{1}{10}}$

b. $4^{\frac{7}{10}}$ d. $4^{-\frac{10}{7}}$

Solve each equation for *x*.

____ 4. $6^{3x-9} = 6^{2x+1}$

a. $\frac{4}{7}$ c. –4

b. $\frac{10}{7}$ d. 10

____ 5. $4^{6x-2} = 4^{10x}$

a. $-\frac{1}{2}$ c. $\frac{1}{2}$

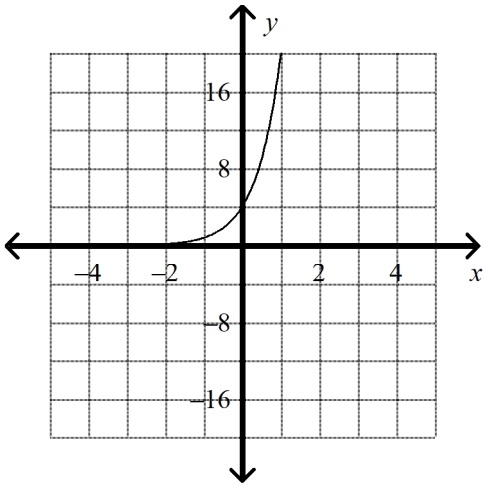
b. $-\frac{3}{4}$ d. $\frac{7}{4}$

Name: _____ **ID: X**

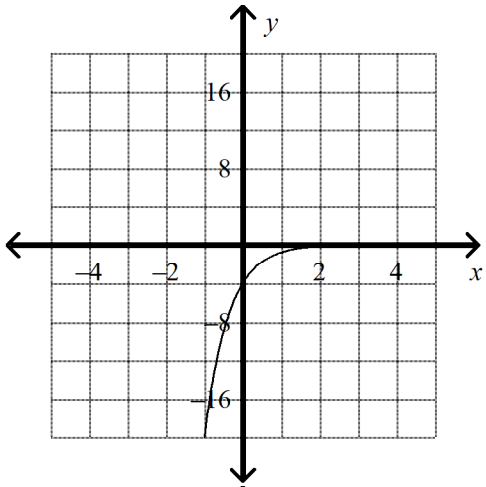
What is the graph of the function?

____ 6. $y = -4 \cdot 5^x$

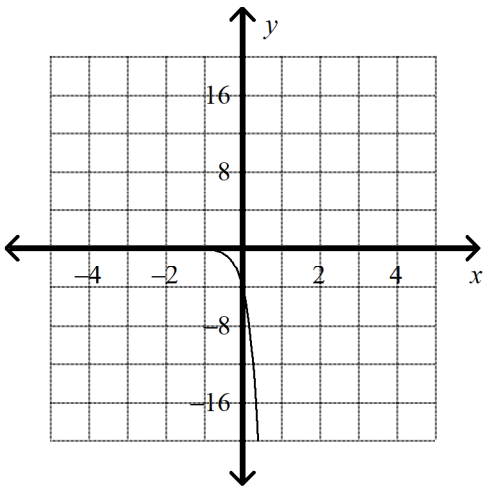
a.



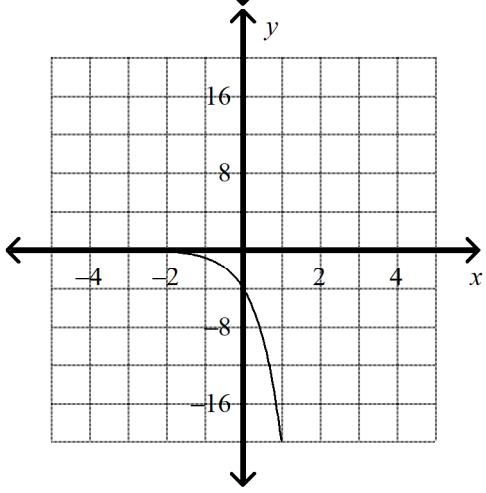
c.



b.



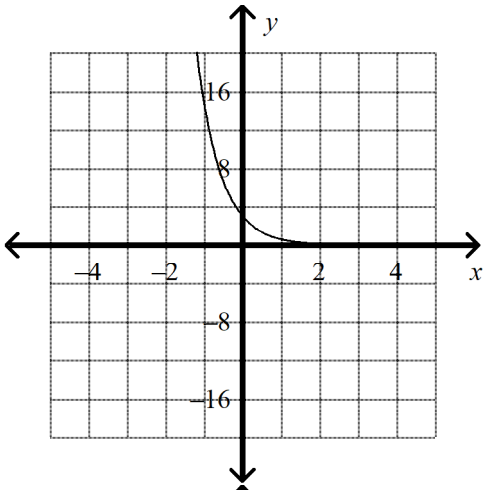
d.



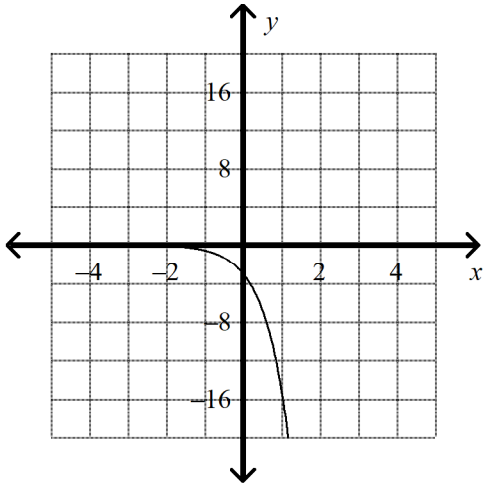
Name: _____ **ID: X**

____ 7. $y = 3 \cdot 5^x$

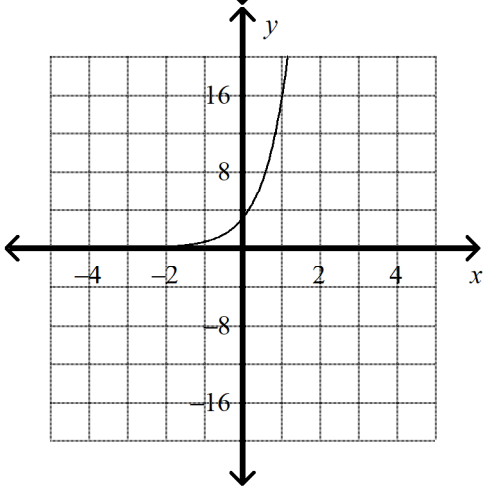
a.



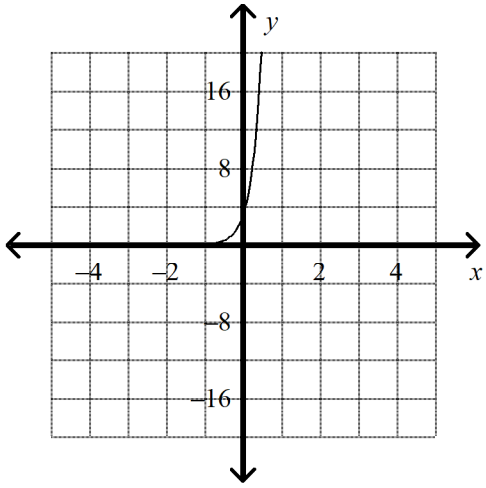
c.



b.



d.



Write an exponential function for each set of points.

____ 8. $(0,25), (1,50), (2,100), (3,200)$ and $(4,400)$

a. $f(x) = 2(25)^{x+1}$

c. $f(x) = 25(2)^x$

b. $f(x) = \frac{1}{2}(25)^x$

d. $f(x) = 25\left(\frac{1}{2}\right)^{x+1}$

____ 9. $(0,7776), (1,1296), (2,216), (3,36)$ and $(4,6)$

a. $f(x) = \frac{1}{6}(7776)^x$

c. $f(x) = 7776(6)^{x+1}$

b. $f(x) = 6(7776)^{x+1}$

d. $f(x) = 7776\left(\frac{1}{6}\right)^x$

____ 10. Does the table represent a linear or an exponential function?

x	1	2	3	4
y	8	11	14	17

a. exponential
b. linear

____ 11. Does the rule $y = -3 \cdot 2^x$ represent a linear or an exponential function?
a. exponential
b. linear

____ 12. A boat costs $8,350 and decreases in value by 12% per year. How much will the boat be worth after 5 years?
a. $14,715.55 b. $8,290.00 c. $4,406.56 d. $3,877.77

____ 13. Suppose a population of 40 crickets doubles in size every month. The function $f(x) = 40 \cdot 2^x$ gives the population after x months. How many crickets will there be after 3 years?
a. 2,880 crickets
b. 240 crickets
c. 320 crickets
d. 2,748,779,069,440 crickets

Find the balance in the account.

____ 14. $1,400 principal earning 7%, compounded monthly, after 22 years
a. $6,202.56
b. $6,501.27
c. $1,591.11
d. $395,472.00

____ 15. $700 principal earning 2.25%, compounded quarterly, after 6 years
a. $799.98
b. $17,178.00
c. $800.87
d. $723.96

____ 16. Write the explicit formula for the geometric sequence.
$a_1 = -5, a_2 = 20, a_3 = -80$
a. $a_n = -5 \cdot (-4)^n$
b. $a_n = -5 \cdot (-4)^{n-1}$
c. $a_n = -4 \cdot (-5)^{n-1}$
d. $a_n = -5 \cdot (4)^n$

Is the sequence geometric? If so, identify the common ratio.

____ 17. 6, 12, 24, 48, ...
a. yes; 2 b. yes; –2 c. yes; 4 d. no

____ 18. 2, –4, –16, –36, ...
a. yes; –2 b. yes; 2 c. yes; –3 d. no

____ 19. Write the recursive formula for the geometric sequence.
$a_1 = -2, a_2 = 8, a_3 = -32$
a. $a_n = -4 + a_{n-1}$
b. $a_n = -2 + a_{n-1}$
c. $a_n = -2 \cdot a_{n-1}$
d. $a_n = -4 \cdot a_{n-1}$

What is the fifth term of the geometric sequence?

____ 20. 5, 15, 45, ...

a. 1215
b. 1875
c. 405
d. 3645

Write the explicit formula for the geometric sequence. Then find the fifth term in the sequence.

____ 21. $a_1 = -4, a_2 = 8, a_3 = -16$

a. $a_n = -4 \cdot (2)^n; -64$
b. $a_n = -4 \cdot (-2)^{n-1}; -64$
c. $a_n = -4 \cdot (-2)^n; 128$
d. $a_n = -2 \cdot (-4)^{n-1}; -512$

____ 22. Write the geometric sequence as a function.

$$a_n = \frac{3}{13}\left(a_{n-1}\right)$$

$$a_1 = 30$$

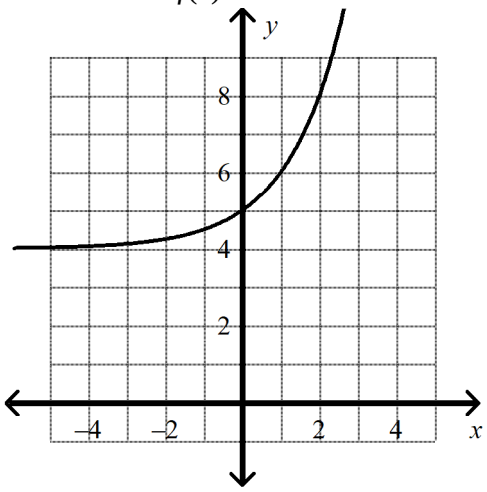
a. $f(n) = 30\left(\frac{3}{13}\right)^{n-1}$
b. $f(n) = \frac{3}{13}(30)^{n-1}$
c. $f(n) = \frac{1}{30}\left(\frac{3}{13}\right)^{n-1}$
d. $f(n) = \left(30 - \frac{3}{13}\right)^{n-1}$

____ 23. A geometric sequence has an initial value of –2 and a common ratio of –3. Write a function to represent the sequence.

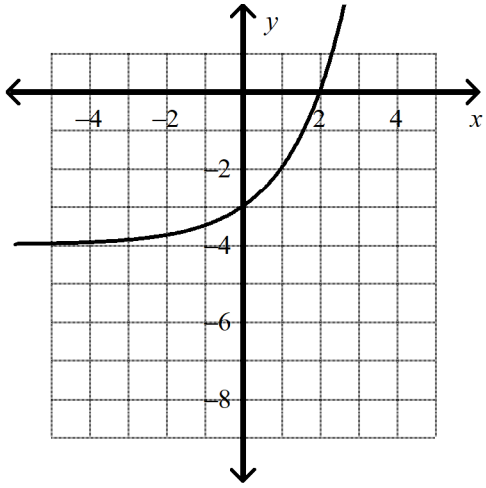
a. $f(n) = -3f(n-1)$
b. $f(n) = -2f(n-1)$
c. $f(n) = -2 \cdot (-3)^{n-1}$
d. $f(n) = -3 \cdot (-2)^{n-1}$

____ 24. Graph the function $f(x) = 2^x + 4$.

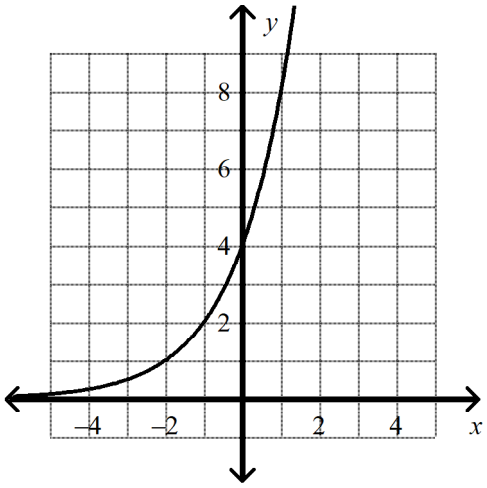
a.



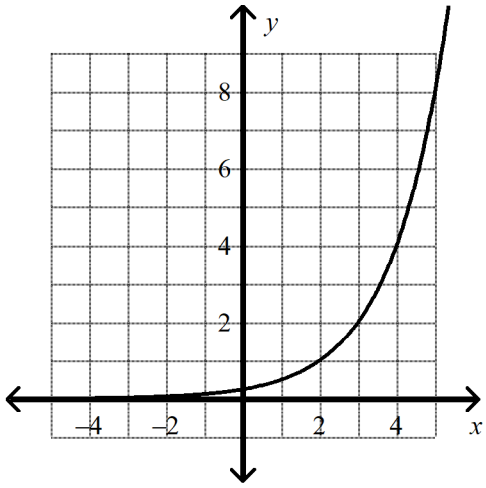
c.



b.



d.



____ 25. Determine the equation of the line that represents the horizontal asymptote of the function $f(x) = 10^x + 8$.

a. $y = 9$
b. $x = 8$
c. $y = 8$
d. $x = 9$

Alg 1 Topic 6 Test Practice
Answer Section

1. ANS: A PTS: 1 DIF: L2
   REF: 6-1 Rational Exponents and Properties of Exponents
   OBJ: 6-1.1 Extend the properties of integer exponents to rational exponents to rewrite radical expressions using rational exponents. NAT: HSN.RN.A.2
   TOP: 6-1 Example 1 Write Radicals Using Rational Exponents
   KEY: index | root | radical expression | rational exponents
2. ANS: C PTS: 1 DIF: L4
   REF: 6-1 Rational Exponents and Properties of Exponents
   OBJ: 6-1.1 Extend the properties of integer exponents to rational exponents to rewrite radical expressions using rational exponents. NAT: HSN.RN.A.2
   TOP: 6-1 Example 1 Write Radicals Using Rational Exponents
   KEY: index | root | radical expression | rational exponents | exponential form
3. ANS: D PTS: 1 DIF: L2
   REF: 6-1 Rational Exponents and Properties of Exponents
   OBJ: 6-1.1 Extend the properties of integer exponents to rational exponents to rewrite radical expressions using rational exponents. NAT: HSN.RN.A.1| HSN.RN.A.2
   TOP: 6-1 Example 1 Write Radicals Using Rational Exponents
   KEY: index | root | radical expression | rational exponents
4. ANS: D PTS: 1 DIF: L3
   REF: 6-1 Rational Exponents and Properties of Exponents
   OBJ: 6-1.2 Solve equations with rational exponents using the properties of exponents.
   NAT: HSN.RN.A.1| HSN.RN.A.2
   TOP: 6-1 Example 3 Use the Power of Power Property to Solve Equations With Rational Exponents
   KEY: rational exponents | power of power property
5. ANS: A PTS: 1 DIF: L3
   REF: 6-1 Rational Exponents and Properties of Exponents
   OBJ: 6-1.2 Solve equations with rational exponents using the properties of exponents.
   NAT: HSN.RN.A.1| HSN.RN.A.2
   TOP: 6-1 Example 3 Use the Power of Power Property to Solve Equations With Rational Exponents
   KEY: rational exponents | power of power property
6. ANS: D PTS: 1 DIF: L3 REF: 6-2 Exponential Functions
   OBJ: 6-2.1 Sketch graphs showing key features of exponential functions.
   NAT: HSA.CED.A.2| HSA.REI.A.11| HSF.IF.B.4| HSF.IF.B.5| HSF.IF.C.7.e| HSF.IF.C.9
   TOP: 6-2 Example 2 Graph Exponential Functions KEY: exponential function
7. ANS: B PTS: 1 DIF: L3 REF: 6-2 Exponential Functions
   OBJ: 6-2.1 Sketch graphs showing key features of exponential functions.
   NAT: HSA.CED.A.2| HSA.REI.A.11| HSF.IF.B.4| HSF.IF.B.5| HSF.IF.C.7.e| HSF.IF.C.9
   TOP: 6-2 Example 2 Graph Exponential Functions KEY: exponential function
8. ANS: C PTS: 1 DIF: L3 REF: 6-2 Exponential Functions
   OBJ: 6-2.2 Write exponential functions using tables and graphs.
   NAT: HSF.IF.B.4| HSF.IF.B.5| HSF.IF.B.6| HSF.LE.A.1
   TOP: 6-2 Example 3 Write Exponential Functions KEY: exponential function

9. ANS: D PTS: 1 DIF: L3 REF: 6-2 Exponential Functions
   OBJ: 6-2.2 Write exponential functions using tables and graphs.
   NAT: HSF.IF.B.4| HSF.IF.B.5| HSF.IF.B.6| HSF.LE.A.1
   TOP: 6-2 Example 3 Write Exponential Functions KEY: exponential function
10. ANS: B PTS: 1 DIF: L2 REF: 6-2 Exponential Functions
    OBJ: 6-2.3 Compare linear and exponential functions.
    NAT: HSA.CED.A.2| HSA.REI.A.11| HSF.IF.B.4| HSF.IF.B.5| HSF.IF.C.7.e| HSF.IF.C.9
    TOP: 6-2 Example 4 Compare Linear and Exponential Functions
    KEY: exponential function
11. ANS: A PTS: 1 DIF: L2 REF: 6-2 Exponential Functions
    OBJ: 6-2.3 Compare linear and exponential functions.
    NAT: HSA.CED.A.2| HSA.REI.A.11| HSF.IF.B.4| HSF.IF.B.5| HSF.IF.C.7.e| HSF.IF.C.9
    TOP: 6-2 Example 4 Compare Linear and Exponential Functions
    KEY: exponential function
12. ANS: C PTS: 1 DIF: L2 REF: 6-3 Exponential Growth and Decay
    OBJ: 6-3.1 Construct exponential growth and decay functions given a description of a relationship.
    NAT: HSA.SSE.A.1.b| HSA.SSE.B.3.c| HSA.CED.A.2| HSF.IF.B.4| HSF.IF.C.8.b| HSF.BF.B.3
    TOP: 6-3 Example 4 Exponential Models of Decay KEY: exponential decay | decay factor
13. ANS: D PTS: 1 DIF: L3 REF: 6-3 Exponential Growth and Decay
    OBJ: 6-3.1 Construct exponential growth and decay functions given a description of a relationship.
    NAT: HSA.CED.A.2| HSA.REI.A.11| HSF.IF.B.4| HSF.IF.B.5| HSF.IF.C.7.e| HSF.IF.C.9
    TOP: 6-3 Example 1 Exponential Growth KEY: exponential function
14. ANS: B PTS: 1 DIF: L3 REF: 6-3 Exponential Growth and Decay
    OBJ: 6-3.1 Construct exponential growth and decay functions given a description of a relationship.
    NAT: HSA.SSE.A.1.b| HSA.SSE.B.3.c| HSA.CED.A.2| HSF.IF.B.4| HSF.IF.C.8.b| HSF.BF.B.3
    TOP: 6-3 Example 2 Exponential Models of Growth
    KEY: exponential growth | growth factor | compound interest
15. ANS: C PTS: 1 DIF: L3 REF: 6-3 Exponential Growth and Decay
    OBJ: 6-3.1 Construct exponential growth and decay functions given a description of a relationship.
    NAT: HSA.SSE.A.1.b| HSA.SSE.B.3.c| HSA.CED.A.2| HSF.IF.B.4| HSF.IF.C.8.b| HSF.BF.B.3
    TOP: 6-3 Example 2 Exponential Models of Growth
    KEY: exponential growth | growth factor | compound interest
16. ANS: B PTS: 1 DIF: L3 REF: 6-4 Geometric Sequences
    OBJ: 6-4.1 Find explicit and recursive formulas for geometric sequences.
    NAT: HSA.SSE.A.1.a| HSF.IF.A.3| HSF.BF.A.1.a| HSF.BF.A.2
    TOP: 6-4 Example 3 Use the Explicit Formula
    KEY: geometric sequence | explicit formula
17. ANS: A PTS: 1 DIF: L2 REF: 6-4 Geometric Sequences
    OBJ: 6-4.1 Find explicit and recursive formulas for geometric sequences.
    NAT: HSA.SSE.B.4
    TOP: 6-4 Example 1 Identify Arithmetic and Geometric Sequences
    KEY: geometric sequence | common ratio
18. ANS: D PTS: 1 DIF: L3 REF: 6-4 Geometric Sequences
    OBJ: 6-4.1 Find explicit and recursive formulas for geometric sequences.
    NAT: HSA.SSE.B.4
    TOP: 6-4 Example 1 Identify Arithmetic and Geometric Sequences
    KEY: geometric sequence | common ratio

19. ANS: D PTS: 1 DIF: L3 REF: 6-4 Geometric Sequences
OBJ: 6-4.1 Find explicit and recursive formulas for geometric sequences.
NAT: HSA.SSE.A.1.a| HSF.IF.A.3| HSF.BF.A.1.a| HSF.BF.A.2
TOP: 6-4 Example 2 Write the Recursive Formula For a Sequence
KEY: geometric sequence | recursive formula

20. ANS: C PTS: 1 DIF: L2 REF: 6-4 Geometric Sequences
OBJ: 6-4.1 Find explicit and recursive formulas for geometric sequences.
NAT: HSA.SSE.B.4 TOP: 6-4 Example 3 Use the Explicit Formula
KEY: geometric sequence

21. ANS: B PTS: 1 DIF: L4 REF: 6-4 Geometric Sequences
OBJ: 6-4.1 Find explicit and recursive formulas for geometric sequences.
NAT: HSA.SSE.B.4 TOP: 6-4 Example 3 Use the Explicit Formula
KEY: geometric sequence

22. ANS: A PTS: 1 DIF: L2 REF: 6-4 Geometric Sequences
OBJ: 6-4.3 Construct exponential functions to represent geometric sequences.
NAT: HSF.IF.A.3| HSF.BF.A.2| HSF.LE.A.2
TOP: 6-4 Example 4 Connect Geometric Sequences and Exponential Functions
KEY: geometric sequence | explicit formula

23. ANS: C PTS: 1 DIF: L3 REF: 6-4 Geometric Sequences
OBJ: 6-4.3 Construct exponential functions to represent geometric sequences.
NAT: HSA.SSE.A.1.a| HSF.IF.A.3| HSF.BF.A.1.a| HSF.BF.A.2
TOP: 6-4 Example 4 Connect Geometric Sequences and Exponential Functions
KEY: geometric sequence | explicit formula

24. ANS: A PTS: 1 DIF: L2
REF: 6-5 Transformations of Exponential Functions
OBJ: 6-5.1 Translate the graph of an exponential function vertically and horizontally, identifying the effect different values of h and k have on the graph of the function.
NAT: HSF.BF.B.3| HSF.IF.B.4| HSF.IF.C.9
TOP: 6-5 Example 1 Vertical Translations of Graphs of Exponential Functions
KEY: exponential parent function

25. ANS: C PTS: 1 DIF: L3
REF: 6-5 Transformations of Exponential Functions
OBJ: 6-5.1 Translate the graph of an exponential function vertically and horizontally, identifying the effect different values of h and k have on the graph of the function.
NAT: HSF.BF.B.3| HSF.IF.B.4| HSF.IF.C.9
TOP: 6-5 Example 1 Vertical Translations of Graphs of Exponential Functions
KEY: exponential parent function