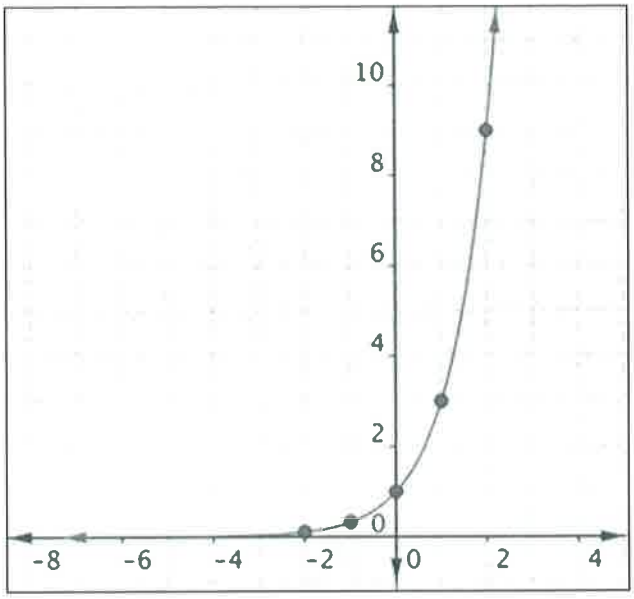
Algebra I
Unit 9 Test Review
Don't forget to study your notes and old homework!

Name KEY
Date _____ Period _____

1. A graph of an exponential function is shown below.



Which function is best represented by the graph?

OPTION 1 - use STAT

OPTION 2 - graph answer choices in y= and find match

A. $f(x) = 3(1)^x$

B. $f(x) = \left(\frac{1}{3}\right)^x$

C. $f(x) = \frac{1}{3}(1)^x$

D. $f(x) = 3^x$

2. The population of the popular town of Smithville in 2003 was estimated to be 35,000 people with an annual rate of increase of about 2.4%. This relationship can be represented by the function $f(x) = 35000(1.024)^x$. What would be an appropriate domain and range for this problem situation?

NOT for real world

A. Domain: all real numbers
Range: all real numbers

B. Domain: all real numbers
Range: $y \geq 35000$

Domain → x
Range → y

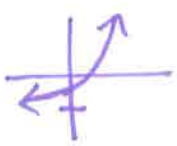
C. Domain: $x \geq 0$
Range: $y > 35000$

D. Domain: $x \geq 0$
Range: $y \geq 35000$

population could equal 35000

3. What is the y-intercept of $g(x) = 2^x - 1.5$?

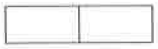
A. (0, .5)
B. (0, - .5)
C. (.5, 0)
D. (- .5, 0)



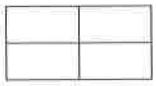
x=0
y=-.5

For #4-5, answer each questions based upon the given pattern.

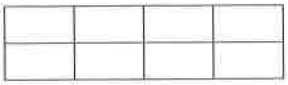
Term 1



Term 2



Term 3



Term # x	# of blocks y
1	2
2	4 (×2)
3	8 (×2)

exponential

multiplying by 2

4. Which of the following equations represents the pattern?

A. $y = 4x - 2$

B. $y = 2^x$

C. $y = (\frac{1}{2})^x$

D. $y = 3x^2 - x$

5. What term number has 2048 blocks?

A. 5
B. 8
C. 10
D. 11

y=2048

check table! in calculator

6. Each year the local country club sponsors a tennis tournament. There are 128 participants, and during each round half of the players are eliminated. This can be represented by the function $f(x) = 128(.5)^x$. If standard notation for an exponential function is $y = a \cdot b^x$, what does the *a* represent in this function?

A. the final number of participants in the tournament
B. the initial number of participants in the tournament
C. the growth ratio of the number of participants in the tournament
D. the decay ratio of the number of participants in the tournament

a = 128

y-intercept

BEGINNING

7. In 2009 the Johnson family bought a boat for $4000. The boat depreciates at a rate of 7% annually. This depreciation is represented by the equation $p = 4000(.93)^t$, where *t* is the time in years. By how much does the value of the boat decrease from $t = 1$ to $t = 6$?

A $1,132
B $6,308
C $1,412
D $2,588

t=1

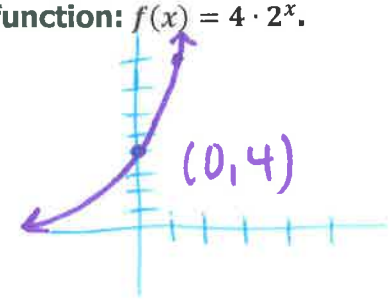
p=3720

t=6

p=2588

3720-2588

For #8-12, answer the following equations using the exponential function: $f(x) = 4 \cdot 2^x$.



8. What is the y-intercept of the given function? x=0

A. (0,2)
B. (2,0)
C. (0,4)
D. (4,0)

9. Find the value of x when f(x)=8? y=8

A. x= -2
B. x= -1
C. x= 0
D. x= 1

10. What is the asymptote of the function? Always y=

A. x=2
B. x=0
C. y=2
D. y=0

11. What is the domain of the function? Domain → x values

A. y>0 oops!
B. x>0
C. All real numbers
D. None of the above

12. What is the range of the function? range → y values Asymptotes!

A. y>0
B. x>0
C. All real numbers
D. None of the above

13. Given the function $f(x) = 4 \cdot 5^x$, match each change below with the effect listed on the right. (**Note**: One of the answer choices will not be used.)

D Change the 4 to $\frac{1}{4}$ $g(x) = \frac{1}{4} \cdot 5^x$

C Change the 4 to 8 $g(x) = 8 \cdot 5^x$

A Change the 5 to $\frac{1}{5}$ $g(x) = 4 \cdot \left(\frac{1}{5}\right)^x$

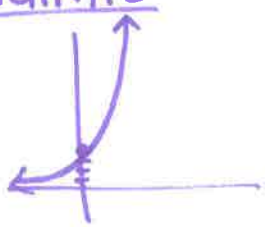
A. The graph would change from increasing to decreasing.

B. The graph would change from decreasing to increasing.

C. The graph would become narrower.

D. The graph would become wider.

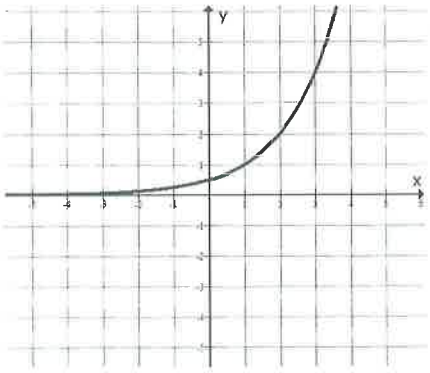
ORIGINAL



Compare on calculator!

For #14– 18, identify each function as linear, quadratic, exponential or neither:

14.



"slide" curve

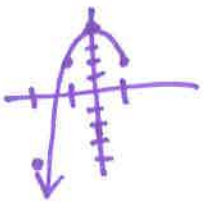
A. Linear
B. Quadratic
C. Exponential
D. Neither

15.

X	Y
-2	-4
-1	2
0	4
1	2

y repeats

A. Linear
B. Quadratic
C. Exponential
D. Neither



16. $f(x) = 10 \cdot (0.8)^x$

x in exponent

A. Linear
B. Quadratic
C. Exponential
D. Neither

17.

X	Y
-1	5
0	9
1	13
2	17

+4 +4 +4

constant rate of change

A. Linear
B. Quadratic
C. Exponential
D. Neither