Warm-up 5-7

Determine if the following are linear or exponential functions, discrete or continuous, and the write a function.

1. A library has 8500 books, and is adding 500 more books each year.

2. A bank account starts with $100. Every month, the amount of money in the account is increased by 15%.

3. There are 3000 whales in the wild. Every decade, the number of owls is halved

Warm-up 5-7

Determine if the following are linear or exponential functions, discrete or continuous, and the write a function.

1. A library has 8500 books, and is adding 500 more books each year.

Linear, Discrete, $f(x) = 8500 + 500x$

2. A bank account starts with $100. Every month, the amount of money in the account is increased by 15%.

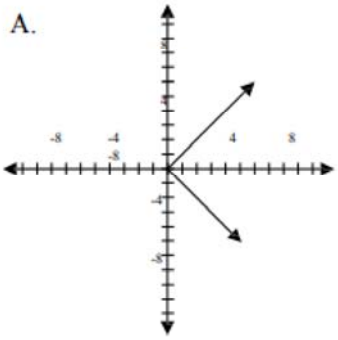
Exponential, Continuous, $f(x) = 100(1.15)^x$

3. There are 3000 whales in the wild. Every decade, the number of whales is halved

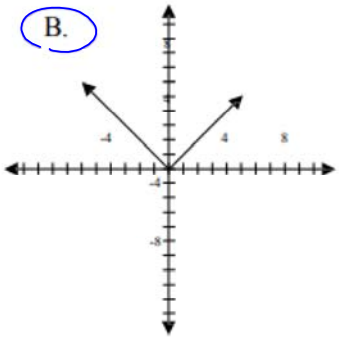
Exponential, Discrete $y = 3000\left(\frac{1}{2}\right)^x$

1. Which graph represents a function?

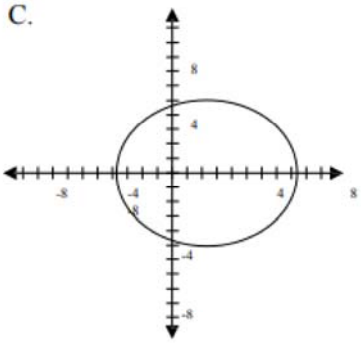
A.



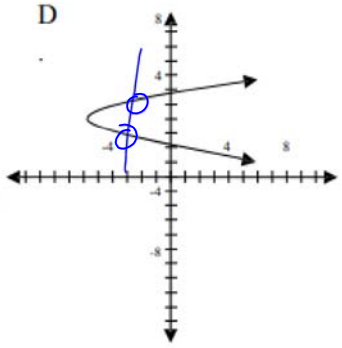
B.



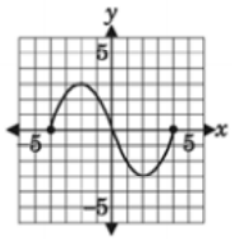
C.



D



2. A function is graphed below.



What is the domain of this function?

A. $-3 < x < 3$

B. $-4 < x < 4$

C. $-3 \leq x \leq 3$

D. $-4 \leq x \leq 4$

Key: D

5. Which of the following situations is best represented by a linear function?

A. The amount Jeremy tips at a restaurant is a function of the total bill. He tips 15% of the total bill.

B. The area of a square is a function of the length of the side of the square.

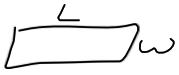
C. The distance a ball travels after being dropped is a function of acceleration and time. The distance is one-half of the acceleration multiplied by the square of the time.

D. The length of the side of a rectangle with an area of 48 is a function of the width of the rectangle.

$y = T(0.15)$

$A = x \cdot x \quad A = x^2$

$D = \frac{1}{2}at^2$



$Lw = 48$

$w = \frac{48}{L}$

Key: A

7. The cost of renting a table at a flea market is based on a fixed price per day plus an initial registration fee. If it costs \$45 to rent a table for one day and a total of \$90 to rent a table for four days, which of the following equations represents the total cost (c) to rent a table at the flea market for d days?

A. $c = 15(d + 30)$

B. $c = 15d + 30$

C. $c = 15d + 45$

D. $c = 15(d + 45)$

Key: B

$c = 15(1) + 30$
$= 15 + 30$
$= 45$ ✓

$c = 15(4) + 30$
$= 60 + 30$
$= 90$ ✓

$c = 15(1 + 45)$
$= 15(46)$
$= 690$ ✗

10. Population A is 800. It grows by 5% each month. Population B is 500. It grows by 20 each month. Which set of statements correctly describes the growth of both populations?

A. Population A is linear.
Population B is exponential.

B. Population A is exponential.
Population B is linear.

C. Population A is exponential.
Population B is exponential.

D. Population A is linear.
Population B is linear.

$A = 800(1.05)^x$

$B = 500 + 20x$

Key: B

11. Which situation must have a linear relationship?

A. The number of bacteria in a sample doubles each hour.

B. The amount of money earned daily on a school fundraiser increased the first week and decreased the second week.

C. The total cost of stamps given that each stamp costs 48¢.

D. The amount of radiation coming from a sample, given that the amount of radiation decreases by half each hour.

$C = 48s$

Key: C

12. Which situation must have an exponential relationship?

A. The number of bacteria in a sample doubles each hour.

B. The amount of money earned daily on a school fundraiser increased the first week and decreased the second week.

C. The total cost of pieces of bubble gum is based on the fact that each piece costs 2¢.

D. The total mass of a box of baseballs depends on the number of baseballs in the box plus the mass of the box.

Key is A

Larry's Dairy sells butter to a local grocery. The equation $y = 2.4x$ can be used to model the relationship between the value of butter and the weight of the butter they sell. They can sell any amount of butter, up to 30 pounds. Which statement is true?

A. The equation has 30 solutions.

B. The equation has no solutions.

C. The equation has 2.4 solutions.

D. The equation has infinite solutions.

Key is D

The height (h), in meters, of an item in d days can be modeled using the equation $h = 3\left(\frac{5}{4}\right)^d$. What does the fraction $\frac{5}{4}$ represent in this equation?

A. The final height of the object is $\frac{5}{4}$ meters.

B. The starting height of the object is $\frac{5}{4}$ meters. (3)

C. The height of the object is multiplied by $\frac{5}{4}$ each day.

D. The height of the object increases by $\frac{5}{4}$ meters each day. +

Key is C

Homework

USATestPrep Practice

Linear and Exponential Worksheet