

Practice Test

High School HS Algebra 1 Unit 5 Comparing Functions

1.

x	f(x)
0	1
2	4
4	16
6	64
8	256

} x 4
} x 4

Does the data in the table represent a linear, quadratic, exponential or other type of function?

- A. Linear
- B. Quadratic
- C. Exponential
- D. Other

2. You are conducting a science experiment in which you measure at equal intervals the number of mold cells present on a piece of bread. At the start of the experiment, there are 30 mold cells. Each time a scheduled observation is made, the number of mold cells has doubled. Write an equation for the number of mold cells present, where x stands for the observation number.

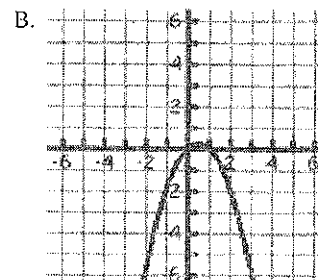
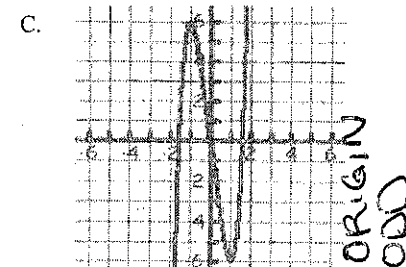
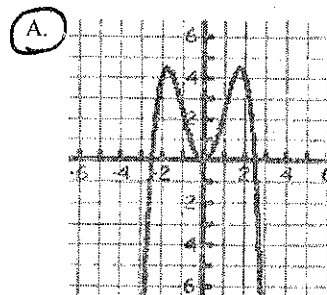
- ~~A. $y = 2x + 30$~~
- ~~B. $y = 2x^2 + 30$~~
- C. $y = 30(2)^x$
- D. $y = 30x^2$

exponential

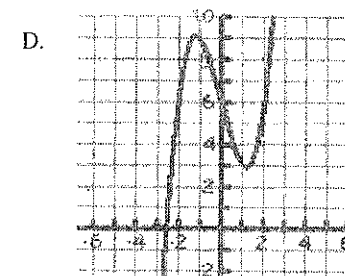
$30(2)^x$

3. Which of the following is the graph of an even function?

y axis symm.

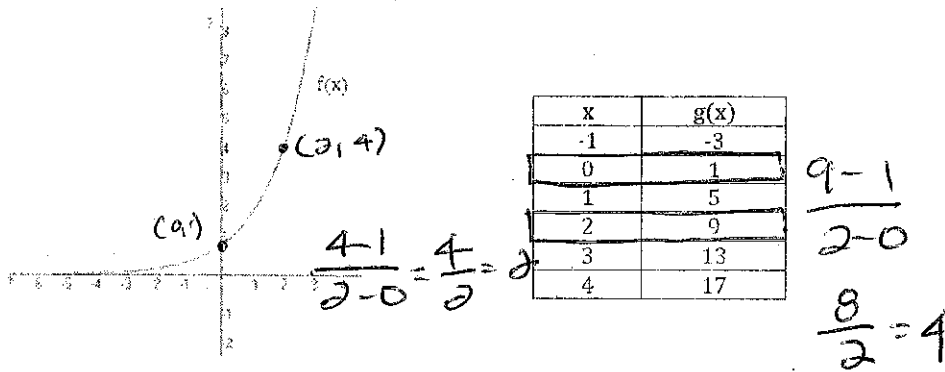


Neither



Neither

4.



Which function, $f(x)$ or $g(x)$, has the greater rate of change over the interval $[0, 2]$?

- A. $f(x)$
- B. $g(x)$
- C. They have the same rate of change.
- D. It is not possible to compare their rates of change.

5. Bacteria cells in a petri dish are multiplying by the hour according to the formula $h(t) = 2^t + 1$, indicating the number of cells present in terms of the number of hours of observation. What would the value of $h(5)$ represent?

- A. The number of cells present after an hour if there were 5 cells in the dish at the start.
- B. The number of cells present after 3 hours if there were 5 cells in the dish at the start.
- C. The number of cells present in the dish after 5 hours of reproducing.
- D. The number of cells present after 2 hours if there were 5 cells in the dish at the start.

$$h(5) = 2^{3(2)} + 1$$

6. Determine whether the function $f(x) = -3x^3 - x^2$ is even, odd, or neither.

- A. Even All exponents even
- B. Odd All exponents odd
- C. Neither

7. A pond has a minnow population of 40,000 that is increasing at a rate of 8% per year. The minnows' algae food supply is decreasing so that it supports 700 less minnows each year.

How is the population of minnows growing, and how is the supply of algae declining?

- A. The minnow population is growing exponentially and the algae supply is declining linearly.
- B. Both the minnows' population growth and the algae supply's decline are exponential.
- C. The minnow population is increasing linearly and the algae supply is declining exponentially.
- D. Both the minnows' population growth and the algae supply's decline are linear.

$$M \text{ pop } 40000(1+0.08)^x$$

$$F \text{ uod } -700x + 40000$$

8.

x	$F(x)$
0	1
1	3
4	9
13	27
40	81

Holly observed the table values above and determined that since $3/1 = 9/3 = 27/9 = 81/27$, the function, F , can be modeled as an exponential function.

Is Holly correct or incorrect? Explain.

- A. Incorrect; the ratios are not constant in an exponential function.
- B. Incorrect; the distance between consecutive x - values is not constant.
- C. Correct; the x - value is doubled each time and 1 is added to give the function value
- D. Correct; the constant ratios of consecutive y - values mean the function must be exponential. **TRUE if x increased at a constant rate**

9. In a certain nature preserve there are 7000 Eastern Meadowlarks, and every decade, the population in the preserve is halved. Does this represent a linear function, a quadratic function an exponential function, or other?

- A. Linear
- B. Quadratic
- C. Exponential
- D. Other

$$7000(1/2)^x$$

10. A fitness center requires its customers to pay an initial membership fee of \$60 plus a \$5 usage fee each time they use the facilities. Does this represent a linear function, a quadratic function an exponential function, or other?

- A. Linear
- B. Quadratic
- C. Exponential
- D. Other

$$60 + 5x$$

11.

x	$f(x)$
-1	-1
0	-2
1	5
2	8
3	11

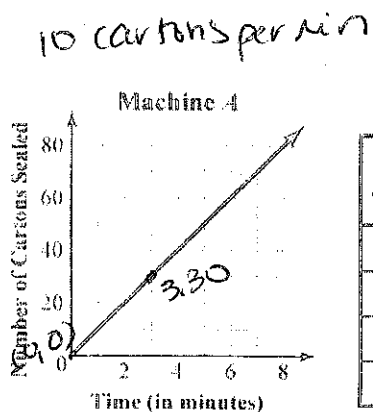
y int
b value →

+3
+3
+3
+3

Decide whether the input-output data displayed in the table above indicates a linear or exponential relationship and write an equation to model the relationship.

- A. Linear: $f(x) = 2x + 3$
- B. Exponential: $f(x) = 2^x$
- C. Linear: $f(x) = 3x + 2$
- D. Exponential: $f(x) = 3^x$

12.



Machine B

Time (in minutes)	Number of Cartons Sealed
3	39
4	52
5	65
6	78

$$\frac{52-39}{4-3} = \frac{13 \text{ cartons}}{1 \text{ min}}$$

The graph and table show the number of cartons that two machines seal in different intervals of time.

Which statement is correct?

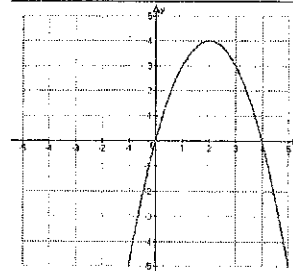
- A. Machine A and Machine B will seal the same number of cartons in 8 minutes.
- B. Machine A and Machine B will seal the same number of cartons in 10 minutes.
- C. The rate at which Machine A seals the cartons is less than the rate at which Machine B seals the cartons.
- D. The rate at which Machine A seals the cartons is greater than the rate at which Machine B seals the cartons.

13.

$$f(x) = -2x^2 + 4x + 6$$

$$\begin{aligned} x &= -\frac{b}{2a} \\ &= -\frac{4}{2(-2)} \\ &= -\frac{4}{-4} \\ &= 1 \end{aligned}$$

Graph of $g(x)$:



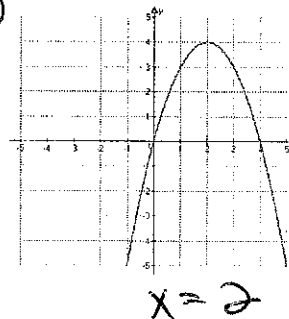
Which function has a greater maximum?

- A. $f(x)$ has the greater maximum, at $x = -1$.
- B. $f(x)$ has the greater maximum, at $x = 1$.
- C. $g(x)$ has the greater maximum, at $x = -2$.
- D. $g(x)$ has the greater maximum, at $x = 2$.

14. Which of the following functions has a line of symmetry of $x = 2$?

A. $y = 5(x-3)^2 + 5$ $x = 3$

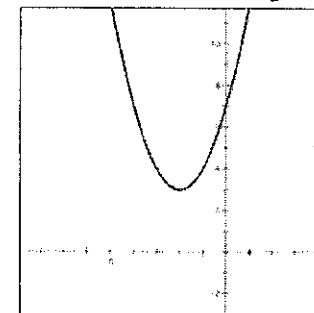
C.



B. $y = -3x^2 - 6x + 1$

$$\begin{aligned} x &= -\frac{b}{2a} \\ &= \frac{6}{2(-3)} \\ &= -1 \end{aligned}$$

D.



$$x = -2$$

15. The number of views of an online video was 3 on the first day. Each day, the number of views quadrupled.

exponential

If the recursive form of this function is $a_n = a_{n-1} \cdot 4$, what is its explicit form and is it linear or exponential?

A. $a_n = 3(n-1)$, linear

B. $a_n = 3 \cdot (n-1)$, linear

C. $a_n = 4^{n-1}$, exponential

D. $a_n = 3 \cdot 4^{n-1}$, exponential

$$3(4)^{x-1}$$

↑ ↑

First
day

so subtract
1 from time