

Comparing Functions

whether the table of values represents a linear, exponential, or quadratic function.

1.

		y-int		vertex	
X	-1	0	1	2	3
Y	9	2	-1	0	-1

quadratic

2.

				y-int	
X	-3	-2	-1	0	1
Y	11	8	5	2	-1

linear

3.

		y-int			
X	-1	0	1	2	3
Y	16	8	4	2	1

exponential

Write an equation to represent #2 and #3 from above.

2. $y = -3x + 2$

3. $y = 8\left(\frac{1}{2}\right)^x$

4. Describe and correct the error in writing an equation for the function represented by the ordered pairs: (-1,1), (0,2), (1,4), (2,8), (3,16)

X	-1	0	1	2	3
Y	1	2	4	8	16

The ordered pairs represent an exponential function.
Said exponential but used a linear equation → exponential
 $y = mx + b$
 $y = 2x + 2$
 $y = 2(2)^x$

Match the scenario to the type. You may not use all types.

5. Each year, Jane records the number of tulips in her garden. The first year she counted 5 tulips. She noticed that the tulips triple each year.
 $a_n = 5(3)^{n-1}$

A. Increasing Linear Function

6. Coach Merrill kicks a soccer ball into the air. The height of the ball is measured over the next several seconds. After 3 seconds, it reaches a maximum height of 100 feet.

B. Decreasing Linear Function

C. Exponential Growth

7. A taxi driver charges an \$8 minimum plus \$0.10 per mile driven.
 $y = 0.10x + 8$

D. Exponential Decay

E. Quadratic Function

8. Ms. Wiggins starts with 100 pencils on the first day of school. Each week, her supply decreases by 6 pencils.
 $a_n = 100 - 6(n-1)$
 $a_n = -6n + 106$

F. Arithmetic Sequence

9. Dr. Jones starts with 6000 bacteria in the lab. Each hour, the amount decreases by half.
 $y = 6000\left(\frac{1}{2}\right)^x$

G. Geometric Sequence

10. You take out a loan for \$5000, and each month, you pay off \$100.
 $y = -100x + 5000$

11. On day 1 of a basketball tournament, there are 64 teams. After each round, one-half of the remaining teams are eliminated.

a. Would this scenario be best represented by a function or sequence?

A sequence since it starts with day 1, and "teams" are discrete not continuous.

b. Make a table showing the number of teams after each round.

x	1	2	3	4	5	6	7	8
y	64	32	16	8	4	2	1	1/2

→ can't have half a team.

c. Determine the type of function/ sequence that best represents this situation.

geometric sequence

d. Write a function/ sequence that models the data.

$$a_n = 64 \left(\frac{1}{2}\right)^{n-1}$$

e. After which round do you know the team that won the tournament?

The 7th round would show the winner

12. Which table of values represents a linear relationship?

X	-1	0	1	2	3
Y	-3	-2	1	6	13

+1 +3 +5 +7

X	-3	-2	-1	0	1
Y	-3	-1	1	3	5

+2 +2 +2 +2

constant ROC

X	-1	0	1	2	3
Y	-1	0	1	8	27

+1 +1 +7 +19

13. The table below shows the average yearly balance in a savings account where interest is compounded annually. Not money is deposited or withdrawn after the initial amount is deposited.

Which type of function best models the given data?

- A. Linear function with a negative rate of change
- B. Linear function with a positive rate of change
- C. Exponential Decay
- D. Exponential Growth

Year	Balance, in Dollars
0	380.00
10	562.49
20	832.63
30	1232.49
40	1824.39
50	2700.54

14. Federal spending (in billions of dollars) for public education during the years 1999 - 2001 is represented by the function $S(x) = 3.32x + 23.16$ where x is the number of years after the beginning of 1990. Which statement below best describes the rate of change of the model?

- A. Each year the spending increased by 23.16 billion dollars on average
- B. Each year 3.32 year period, the spending increased by a billion dollars on average
- C. Each year, spending increased by 3.32 billion dollars on average
- D. Each year, spending decreased by 3.32 billion dollars on average