

Module 2 Test Review

For questions 1-13 determine whether the relationships being represented are
 (a) = Linear, (b) = Exponential, (c) = Neither

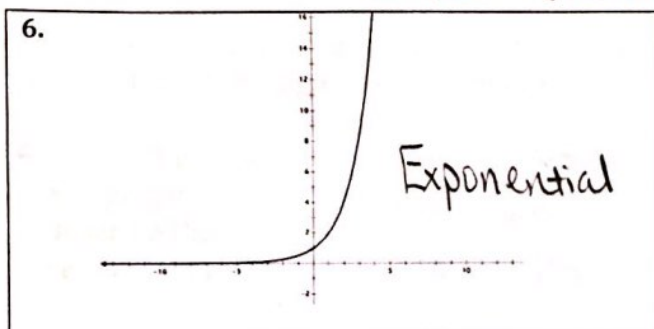
1. $f(x) = \frac{1}{3}x + 2$ Linear (Slope Intercept Form)

2. $f(x) = x^2$ Neither ↕

3. $f(0) = 2$ $f(n) = f(n-1) + 4$ Linear

4. $f(x) = 10\left(\frac{1}{2}\right)^x$ Exponential

5. $f(x) = \frac{1}{4}(x+3) + 2$ Linear (Point Slope Form)

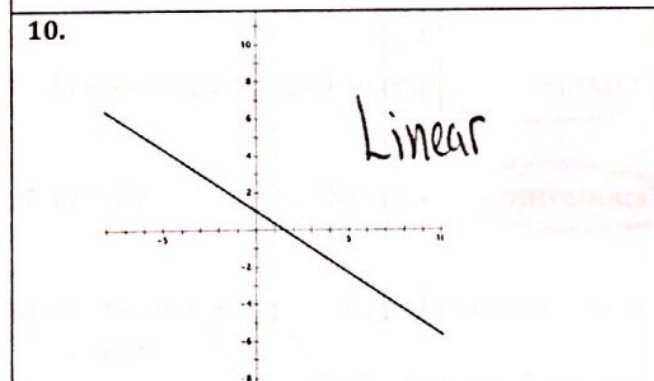
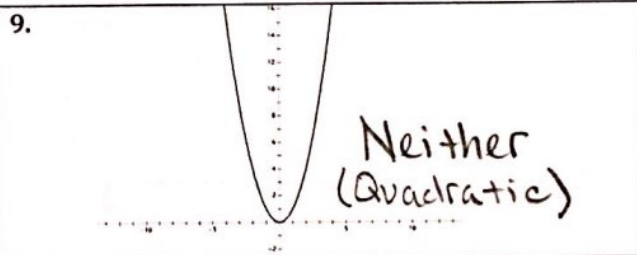


7.

x	f(x)	x	f(x)
4	4	2	-8
5	10	3	4
2	-8	5	10
7	22	7	22

Linear d=6

8. Janet wants to know how many seats are in each row of the theater. Jamal lets her know that each row has 4 seats more than the row in front of it. The first row has 10 seats.
 $d=4$ Linear



11.

x	f(x)
1.5	3
2.5	9
3.5	27
5.5	243

$r=3$
Exponential

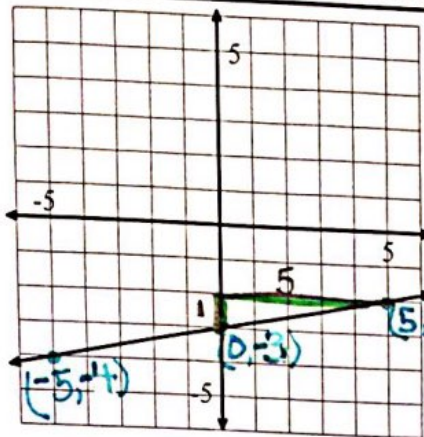
12.

x	f(x)
2	-2
3	6
4	14
5	22

$d=8$
Linear

13. Sally's cookie bakery is so delicious! She started by cooking 3 dozen cookies per day. She starts spreading the word on social media, and she's a hit!! Business begins to multiply. To meet demands, she begins to double the amount of cookies she makes each day.
 $r=2$ Exponential

14. Write the explicit function for the graph shown below using both forms of a linear equation.



$m = \frac{1}{5}$

Point Slope Form: $y = \frac{1}{5}(x-5) - 2$

Point Slope Form:

$y = \frac{1}{5}(x-0) - 3$

or $y = \frac{1}{5}(x+5) - 4$

Use any point on the line!

Slope Intercept Form:

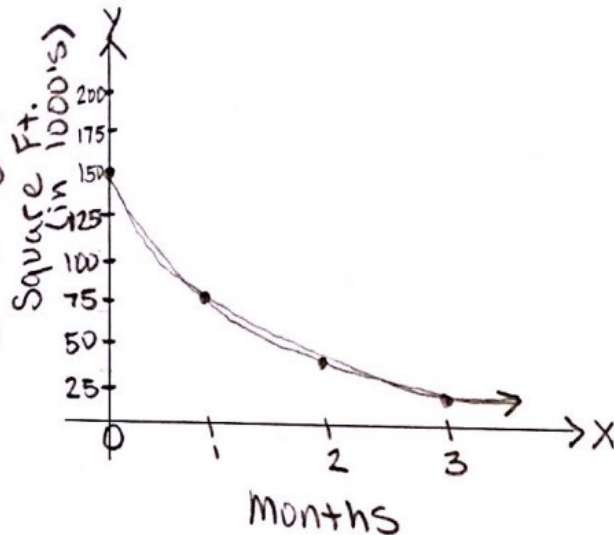
$y = \frac{1}{5}x - 3$

The harbor at Green Top Lake has a lot of green algae at the end of the summer. However, as the weather gets colder, the algae begins to die. At the beginning of fall, the harbor has 150,000 square feet of algae. Suppose half of the algae dies per month...

15. Fill in the table and graph to describe the relationship.

$r = \frac{1}{2}$

Months	Algae in Harbor
0	150,000
1	75,000
2	37,500
3	18,750



16. Is the relationship Linear or Exponential?

17. Is the relationship Discrete or Continuous? The change does not happen at once *

18. Write an explicit function that shows how much algae is in the harbor for x months from the beginning of the fall.

amt. of algae $\rightarrow y = \underbrace{150000}_{\text{initial value}} \left(\frac{1}{2}\right)^x \leftarrow \# \text{ months}$
 common ratio

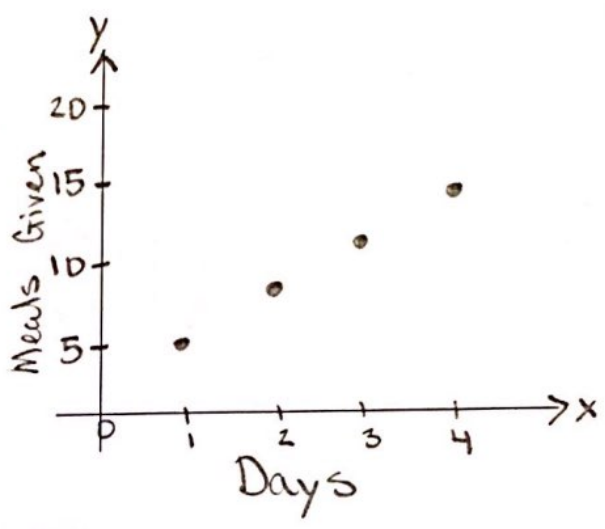
19. Explain what each piece of your explicit function represents.

There was a wonderfully benevolent man, very gracious and interested in providing meals to those in need. He started by giving out 5 meals (dinners) on the first day. Each day, he is able to give out three more meals to those in need.

20. Fill in the table and graph to describe the relationship.

X	Y
Days	Meals Given
0	2
1	5
2	8
3	11
4	14

$d=3$



21. Is the relationship Linear or Exponential?

22. Is the relationship Discrete or Continuous?

N	Z	Q	R
<u>Natural Numbers</u>	<u>Integers</u>	<u>Rational Numbers</u>	<u>Real Numbers</u>

23. What is the domain of this function?

- (a) $\{x|x \in \mathbb{Z}\}$
- (c) $\{x|x \in \mathbb{N}\}$

- (b) $\{x|x \in \mathbb{Q}, x < 0\}$
- (d) $\{x|x \in \mathbb{R}\}$

x values
is a member of

the set of x such that

24. Write an explicit function that shows how many meals were given out.

Meals Given $\rightarrow y = 3x + 2$ ← Initial Amount

↑ day

25. Explain what each piece of your explicit function represents.

Common difference

26. Explain why a sequence is discrete. The change happens all at once - An example is a recursive function

27. Use exponent rules to simplify each exponential expression so that it contains only positive exponents.

a. $\frac{b^4}{b^8} = b^{4-8} = b^{-4} = \frac{1}{b^4}$ b. $\frac{24x^4}{8x^{-2}} = \frac{3x^4x^2}{1} = 3x^6$ c. $\frac{9x^2}{x^{-2}} = 9x^2 \cdot x^2 = 9x^4$

d. $(2t)^{-3} = 2^{-3}t^{-3} = \frac{1}{2^3t^3} = \frac{1}{8t^3}$ e. $-6xy^{-4} = \frac{-6x}{y^4}$ f. $(-7x^3)^2 = 7^2x^6 = 49x^6$

28. Which of the following is an example of a discrete function?

- A. Time in a race
- B. The number of students in a class
- C. A dog's weight
- D. The length of a growing leaf

29. A movie ticket used to cost \$4.25 back in 1990. Inflation exists because products increase in value over time. The inflation rate is about 3.5% per year. In what year can we expect the price of a movie ticket to exceed \$5.50? Use a table to help organize your thinking. You can use $x = 0$ for 1990.

$r = 100\% + 3.5\% = 103.5\% = 1.035$

year	0	1	...	8
	1990	1991		1998
\$	4.25			5.5964 5.60

You can put the explicit equation in your calculator & view the table

In the year 1998 the price > \$5.50

$y = 4.25(1.035)^x$

30. Find the equation of a line that goes through the points (8, -4) and (-4, 10).

- A. $y = -\frac{7}{6}(x + 4) + 10$
- B. $y = \frac{7}{6}(x - 8) - 4$
- C. $y = -\frac{6}{7}(x + 4) + 10$
- D. $y = -\frac{7}{6}(x + 8) - 4$

$m = \frac{10 - (-4)}{-4 - 8} = \frac{14}{-12} = -\frac{7}{6}$