

# 11.2.D2 - LINEAR VS. QUADRATIC FUNCTIONS

Calculate the first and second differences for each table of values. Describe the type of function represented by the table: linear or quadratic. Refer to the 11.2 example "Identifying Linear & Quadratic Functions" in the Chapter 11 Summary.

1.

$x$	$y$	FIRST DIFFERENCES	SECOND DIFFERENCES
-2	-6		
-1	-3	_____	
0	0	_____	_____
1	3	_____	_____
2	6		

2.

$x$	$y$	FIRST DIFFERENCES	SECOND DIFFERENCES
-2	12		
-1	3	_____	
0	0	_____	_____
1	3	_____	_____
2	12		

3.

$x$	$y$	FIRST DIFFERENCES	SECOND DIFFERENCES
-3	3		
-2	4	_____	
-1	5	_____	_____
0	6	_____	_____
1	7		

4.

$x$	$y$	FIRST DIFFERENCES	SECOND DIFFERENCES
-1	1		
0	0	_____	
1	3	_____	_____
2	10	_____	_____
3	21		

5.

$x$	$y$	FIRST DIFFERENCES	SECOND DIFFERENCES
-4	-48		
-3	-27	_____	
-2	-12	_____	_____
-1	-3	_____	_____
0	0		

6.

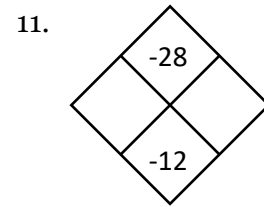
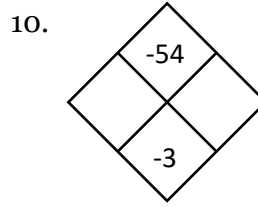
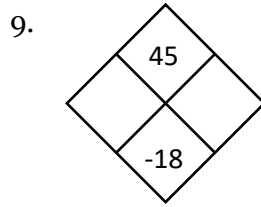
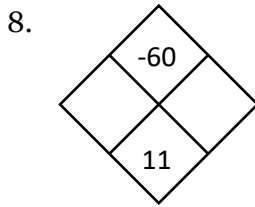
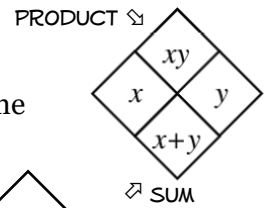
$x$	$y$	FIRST DIFFERENCES	SECOND DIFFERENCES
-1	10		
0	8	_____	
1	6	_____	_____
2	4	_____	_____
3	2		

7. The Quickgrow Fertilizer Company is working on different formulas for flower fertilizers. The table shows the growth of unfertilized plants A and the growth of fertilized plant B.

Which plant height would be represented by a linear function? Which would be represented by a quadratic function? Explain your reasoning.

TIME (DAYS)	HEIGHT OF PLANT A (CM)	HEIGHT OF PLANT B (CM)
0	4	3
1	6	4
2	8	6
3	10	9
4	12	13
5	14	18
6	16	24

An X-box is a pattern for which the product of two numbers is placed on top, while the sum of the same two numbers is placed on the bottom. This pattern is demonstrated in the X-box at right. Copy and complete each X-box pattern below.



**1<sup>ST</sup> SEMESTER SPIRAL REVIEW** – Refer to your 1<sup>st</sup> semester summary card.

12. Owen’s hourly pay for delivering pizzas is  $f(x) = 6.50 + 0.75x$ , where  $x$  is the number of pizzas he delivers. Which statements are true about Owen’s pay? Select ALL that apply.
- If Owen delivers no pizzas, his pay is \$6.50 per hour.
  - Owen earns 75% of the cost of each pizza.
  - If Owen delivers 10 pizzas in one hour, he earns \$14 for that hour.
  - Owen earns \$6350 for each pizza he delivers plus \$0.75 per hour.
  - Owens earns \$0.75 for each pizza he delivers.

13. Renee is saving money to buy a car. The table shows the total amount of her savings after  $x$  months.

Month, $x$	0	1	2	3
Total savings in dollars, $y$	485	598	711	824

- What type of function models this situation: linear or exponential? Explain your reasoning.
- Write a function in either  $y = a(b)^x$  or  $y = mx + b$  form to model this situation.
- Complete the table to show the value of her savings after 7, 10, 12, and 15 months.

Month, $x$	7	10	12	15
Total savings in dollars, $y$				

14. Anya and Jake started new jobs at the same time. Anya’s starting salary was \$42,000, and she gets a \$1500 raise each year. Jake’s starting salary was \$40,000 and he gets a 3% raise each year.
- Write a function – linear,  $y = mx + b$ , or exponential,  $y = a(b)^x$  – to represent Anya’s salary,  $y$ , after  $x$  years.
  - Write a function – linear,  $y = mx + b$ , or exponential,  $y = a(b)^x$  – to represent Jake’s salary,  $y$ , after  $x$  years.
  - Who will be making more money in 10 years? Who will be making more money in 20 years?