

WORKING WITH FUNCTIONS IN TABLE FORM
N-GEN MATH[®] ALGEBRA I



We have mostly worked with functions in the forms of equations and graphs. In this lesson, we will work more with functions in terms of tables.

Exercise #1: A table is shown below for a function $f(x)$. Answer the following questions based on the table.

x	-4	-3	-2	-1	0	1	2	3	4	5	6	7
$f(x)$	-20	-9	0	7	12	15	16	15	12	7	0	-9

(a) Evaluate each of the following:

$$f(-1) =$$

$$f(4) =$$

(b) Determine the value of $f(3) - f(-3)$.

(c) If this function's graph were created, what would be its y -intercept? Explain.

(d) What are the zeros of this function as indicated by the table?

Exercise #2: Various input/output pairs for three functions are shown in table form below. Which of the three functions has the greatest y -intercept? Justify your response.

x	$f(x)$
-1	-8
0	4
3	9
5	0

x	$g(x)$
0	14
2	0
4	-5
7	-1

x	$h(x)$
-5	0
-3	5
0	11
6	3

Exercise #3: Cameron is driving their car home from college. The distance they are from home, d , is given as a function of the time they have been driving, t , using the table below.

Calculate $d(4) - d(2)$ and give an interpretation about what the result means in the context of this problem.

t , hours	0	1	2	3	4
$d(t)$, miles	356	298	235	183	123



Our graphing calculator can help us produce tables for functions if we have an equation for the function.

Exercise #4: For the function $f(x) = -2x + 8$ do the following.

x	-2	-1	0	1	2	3	4	5
$f(x)$								

- (a) Use your calculator's table option to help fill out the outputs in the table above.
- (b) What is the y -intercept of the function? (c) List any zeros of the function below.

When functions become more complicated, such as involving a squared term, more interesting things can happen.

Exercise #5: Given the function $f(x) = x^2 - 10x + 16$ do the following.

x	0	1	2	3	4	5	6	7	8	9	10
$f(x)$											

- (a) Use your calculator's table option to help fill out the outputs in the table above.
- (b) What are the zeros of the function that appear in the table? (c) Does the function appear to have a turning point? If so, what are its coordinates?

Exercise #6: The function $g(x) = x^3 - 4x^2 - 31x + 70$ has three integer zeros on the interval $-10 \leq x \leq 10$. Set up a table on your calculator to determine the values of the zeros.

Exercise #7: A rocket is launched into the air such that its height as a function of time is given by the equation $h(t) = -16t^2 + 144t$. Use a table on your calculator to determine when the rocket reaches its maximum height.



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FLUENCY

1. A function, $f(x)$, has values given in the table below. Which of the following is its y -intercept?

- (1) -2
 (2) 2
 (3) 5
 (4) 9

x	-2	-1	0	1	2
$f(x)$	9	7	5	3	0

2. A function $g(x)$ is shown in the table below. Answer the following questions based on the table.

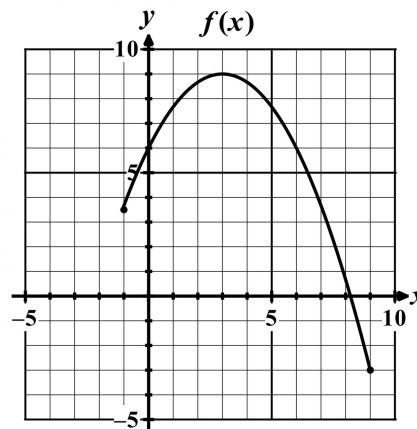
x	-2	-1	0	1	2	3	4	5	6	7	8
$g(x)$	-3	0	3	6	9	12	9	6	3	0	-3

- (a) What is the y -intercept of function?
 (b) What are the zeros of this function?
 (c) Determine the value of $g(5) - g(-2)$.
 (d) What is the maximum value of this function?

3. Two functions are shown below. Compare the two functions by answering the following questions.

- (a) Which function has the greater y -intercept?
 Justify your answer.

- (b) Each of these two functions has a single zero.
 Which one has the greater zero? Justify.



x	$g(x)$
-2	12
0	8
2	4
4	0
6	-4
8	-8



4. For the function defined by $f(x) = 16 - x^2$ do the following.

x	-5	-4	-3	-2	-1	0	1	2	3	4	5
$f(x)$											

- (a) Use your calculator's table option to help fill out the outputs in the table above.
- (b) State the function's y -intercept. (c) State all zeros of the function.
- (d) Using values from your table, determine the value of the expression shown below.

$$\frac{f(1) - f(-3)}{1 - (-3)}$$

5. The function $h(x) = x^4 - 5x^3 - 37x^2 + 89x + 120$ has four zeros on the interval $-10 \leq x \leq 10$. Which of the following sets represents these zeros?

- (1) $\{-7, -3, 4, 7\}$ (3) $\{-8, -4, 2, 5\}$
- (2) $\{-5, -1, 3, 8\}$ (4) $\{-4, 1, 6, 9\}$

APPLICATIONS

6. Lennon was recording the temperature outside starting at 5:00 p.m. The table below shows the temperature, in degrees Fahrenheit, as a function of the number of hours after 5:00 p.m.

h	0	1	2	3	4	5
$F(h)$	68	66	62	57	54	52

- (a) What is the y -intercept of this function? What does it represent in the context of this problem?
- (b) Find the value of $F(5) - F(0)$. Using appropriate units, give an interpretation of this value in the context of this problem.

