2

Algebra 1

Functions

Name: Key

Date: _____

Determine if the following relations are functions. Describe the domain and range.

1. **{ (5, -1), (0 , 3), (-2 , -4), (6 , -1) (-2 , 3) }**

   Function? No Domain: {-2, 0, 5, 6} Range: {-4, -1, 3}

2. **{ (9 , 2), (-4 , -1), (0 , -3), (-7 , 6) (5 , -2) }**

   Function? Yes Domain: {-7, -4, 0, 5, 9} Range: {-3, -2, -1, 2, 6}

Determine if the following tables and mappings are functions. Describe the domain and range.

3.

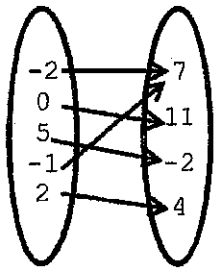
x	y
3	9
8	24
-2	-6
0	0

Function? Yes

Domain: {-2, 0, 3, 8}

Range: {-6, 0, 9, 24}

4.

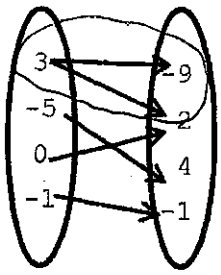


Function? Yes

Domain: {-2, -1, 0, 2, 5}

Range: {-2, 4, 7, 11}

5.



Function? No

Domain: {-5, -1, 0, 3}

Range: {-9, 1, 2, 4}

6.

x	y
-6	8
2	3
-6	-11
4	-2

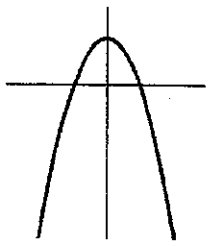
Function? No

Domain: {-6, 2, 4}

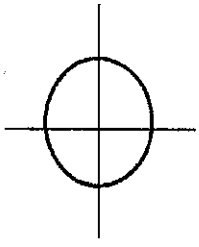
Range: {-11, -2, 3, 8}

Determine if the following graphs are functions. Use the vertical line test.

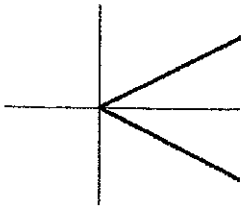
7. Function? Yes



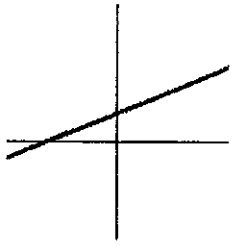
8. Function? No



9. Function? No



10. Function? Yes



Name_____

WS 10-6-4 "Function Notation"

Date_____ Period____

Write in function notation.

1) $y = 5x + 3$

$f(x) = 5x + 3$

2) $C = 12n - 100$

$f(n) = 12n - 100$

3) $d = 50t$

$f(t) = 50t$

4) $m = 4p^2 - 3p + 7$

$f(p) = 4p^2 - 3p + 7$

Write as an equation with two variables.

5) $f(x) = 6x - 9$

$y = 6x - 9$

6) $h(x) = x^2 - 5x + 9$

$y = x^2 - 5x + 9$

7) $g(t) = 8t^3$

$y = 8t^3$

8) $C(n) = 15n + 90$

$y = 15n + 90$

Evaluate each function. Substitute the values for x into the equation.

9) $w(x) = 4x + 5$; Find $w(-8)$

$w(-8) = 4(-8) + 5$

$w(-8) = -32 + 5$

$w(-8) = -27$

10) $h(x) = 2x + 5$; Find $h(2)$

$h(2) = 2(2) + 5$

$h(2) = 9$

11) $g(n) = 4n - 5$; Find $g(6)$

$g(6) = 4(6) - 5$

$g(6) = 19$

12) $g(n) = n + 2$; Find $g(1)$

$g(1) = 1 + 2$

$g(1) = 3$

13) $g(n) = n^2 + 4n$; Find $g(2)$

$g(2) = 2^2 + 4(2)$

$g(2) = 4 + 8$

$g(2) = 12$

14) $h(n) = 3n^2 - 4$; Find $h(0)$

$h(0) = 3(0)^2 - 4$

$h(0) = -4$

15) $h(n) = -3n^2 - 5n$; Find $h(2)$

$h(2) = -3(2)^2 - 5(2)$

$h(2) = -12 - 10$

$h(2) = -22$

16) $h(x) = x^3 + 4$; Find $h(-5)$

$h(-5) = (-5)^3 + 4$

$h(-5) = -125 + 4$

$h(-5) = -121$

9

13. $f(x) = 2x^2 - 3$

Find $f(2)$

$f(2) = 2(2)^2 - 3$

$f(2) = 5$

14. $h(x) = x^3 - 4x$

Find $h(2)$

$h(2) = 2^3 - 4(2)$

$h(2) = 0$

15. $f(x) = (x+2)^2 - 6$

Find $f(2)$

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

$f(2) = 10$

If $f(x) = 2x - 3$, $g(x) = x^3 - 2$, and $h(x) = x^2 - 3x + 5$, find each of the following:

16. f(4) =

$f(4) = 2(4) - 3$

$f(4) = 5$

17. h(-3) =

$h(-3) = (-3)^2 - 3(-3) + 5$

$h(-3) = 9 + 9 + 5$

$h(-3) = 23$

18. g(-2) =

$g(-2) = (-2)^3 - 2$

$g(-2) = -8 - 2$

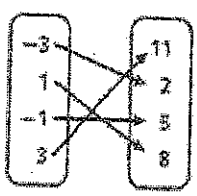
$g(-2) = -10$

20. Which is NOT a correct way to describe the function $\{(-3, 2), (1, 8), (-1, 5), (3, 11)\}$?

$x: -3, 1, -1, 3$

$y: 2, 8, 5, 11$

Ⓕ



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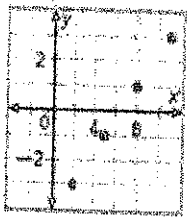


Ⓗ Domain: $\{-3, 1, -1, 3\}$

Range: $\{2, 8, 5, 11\}$

Ⓙ

x	y
-3	2
-1	5
1	8
3	11

21. Use the table to answer the following:

x	-3	-1	0	1	3
y	5	7	9	11	13

a. Express the relation as ordered pairs.

$\{(-3, 5), (-1, 7), (0, 9), (1, 11), (3, 13)\}$

b. Give the domain and range of the relation.

D: $\{-3, -1, 0, 1, 3\}$ R: $\{5, 7, 9, 11, 13\}$

c. Does the relation represent a function? Explain.

yes, x's don't repeat

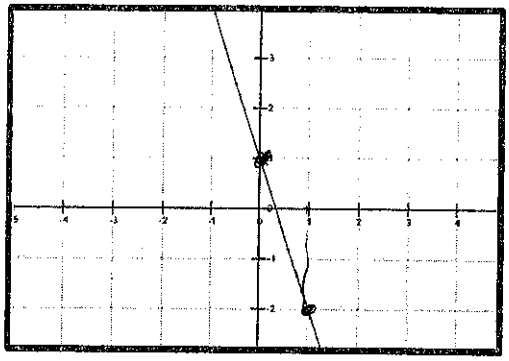
Algebra 1

Name _____

Date _____ Period _____

For each, evaluate f(1). Use the function statement to create an ordered pair solution.

1.



f(x)

f(1) = -2 → (1, -2)

2.

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

f(1) = 2 → (1, 2)

3. f(x) = 3x + 13 $f(1) = 3(1) + 13 = 16$

f(1) = 16 → (1, 16)

When you are given a problem in the form f(1) = (blank), the number 1 represents the input (x-value), and your job is to find the corresponding y-value. What if instead you were given f(blank) = 1. In this case, the number 1 represents the output (y-value) and your job would be to give the x-value that result in this output. Let's try a few:

Using each of the functions ABOVE, determine where f(x) = 1.

1. f(0) = 1 (graph) where is y=1? when x is 0

2. f(3) = 1 (table) where is f(x) = 1? when x is 3

3. f(-4) = 1 (function)

$3x + 13 = 1$

$-13 \quad -13$

$\frac{3x}{3} = \frac{-12}{3}$

$x = -4$

Exercises: Fill in the blank with the correct x-value.

4. If g(x) = 4x – 7, determine when g(x) = 21.

g(7) = 21

$4x - 7 = 21$

$+7 \quad +7$

$\frac{4x}{4} = \frac{28}{4}$ $x = 7$

5. If h(x) = 3 – 2x, determine when h(x) = -9.

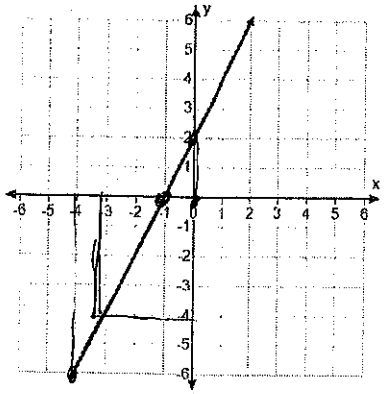
h(6) = -9

$3 - 2x = -9$

$-3 \quad -3$

$\frac{-2x}{-2} = \frac{-12}{-2}$ $x = 6$

6. Use the graph to fill in each blank.



a.) f(-4) = -6

b.) f(0) = 2

c.) f(-3) = -4

d.) f(-1) = 0

7. Use the table to fill in each blank.

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

a.) f(5) = 0

b.) f(0) = 1

c.) f(-2) = 5

d.) f(5) = 0

Period: _____ Date: _____

1. Evaluate the following expressions given the functions below:
Show your substitutions (the expression with the variable replaced by a number).

$g(x) = -3x + 1$ $f(x) = x^2 + 7$ $h(x) = \frac{12}{x}$ $j(x) = 2x + 9$

REMEMBER***
f(-3) means -3 is your input and you plug it in for x

f(x) = -3 means that your whole function is = to -3 and you plug into the y.

a. $g(10) = -3(10) + 1 = -29$

$g(10) = -29$

b. $f(3) = 3^2 + 7$
$f(3) = 9 + 7$

$f(3) = 16$

c. $h(-2) = \frac{12}{-2} = -6$

$h(-2) = -6$

d. $j(7) = 2(7) + 9 = 23$

$j(7) = 23$

e. $h(a)$

h

$h(a) = \frac{12}{a}$

f. Find x if $g(x) = 16$

$-3x + 1 = 16$
$-1 \quad -1$
$\frac{-3x = 15}{-3 \quad -3}$
$x = -5$

g. Find x if $h(x) = -2$

$x \cdot \frac{12}{x} = -2 \cdot x$

$\frac{12}{-2} = \frac{-2x}{-2}$ $x = -6$

h. Find x if $f(x) = 23$

$x^2 + 7 = 23$
$-7 \quad -7$
$\sqrt{x^2} = \sqrt{16}$ $x = \pm 4$

2. Translate the following statements into coordinate points and graph:

a. $f(-1) = 1$ $(-1, 1)$ ex (x, f(x))

b. $f(2) = 7$ $(2, 7)$

c. $f(1) = -1$ $(1, -1)$

d. $f(3) = -5$ $(3, -5)$

e. $f(4) = 2$ $(4, 2)$