Warm Up 1/5/18

Evaluate each expression for:

a = 2, b = -3, and c = 8.

1. a + 3c

$2+3(8)$

$=26$

2. ab - c

$2(-3)-8$

$-6-8=-14$

3. $\frac{1}{2}c+b$

$\frac{1}{2}(8)+-3$

$4+-3$

1

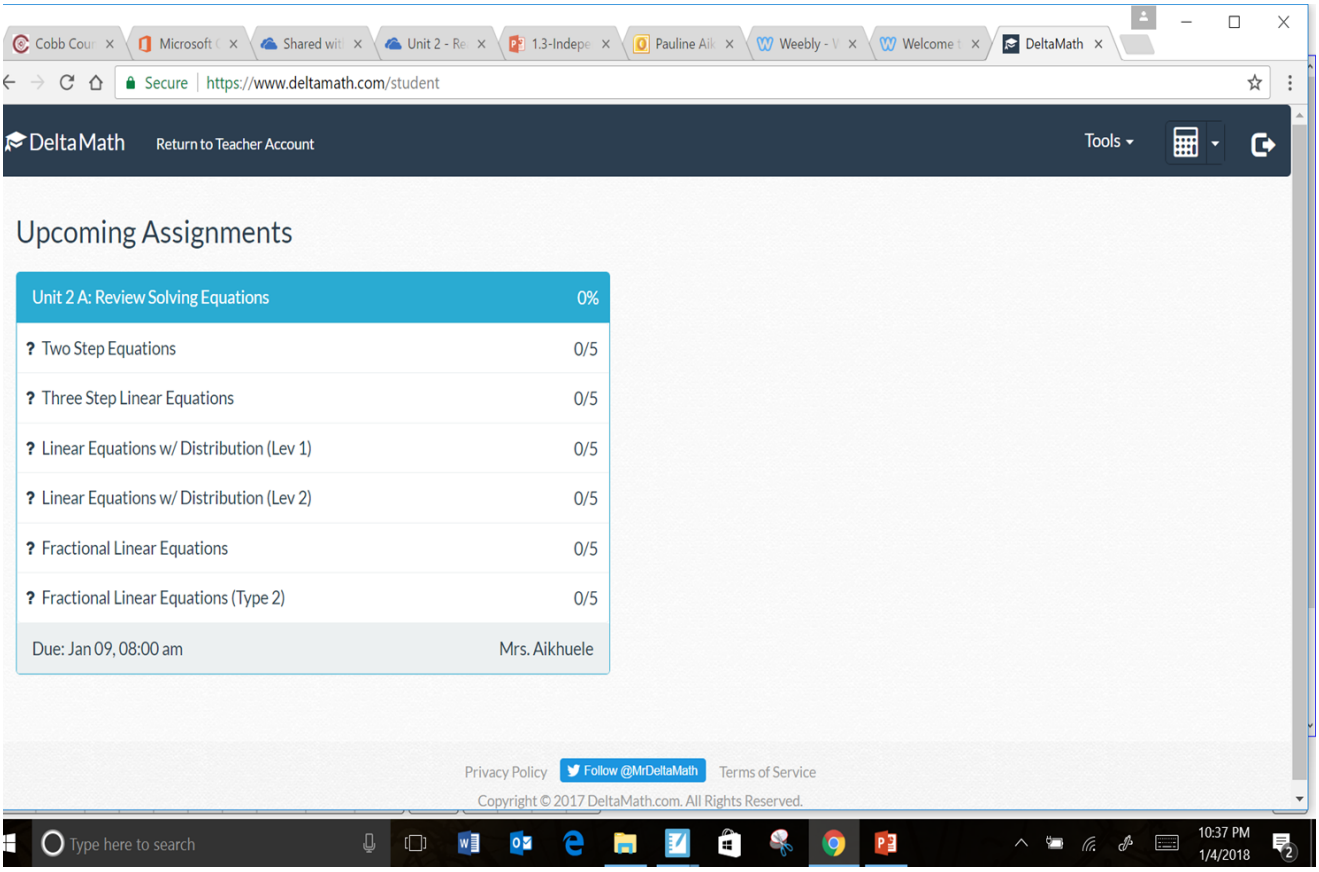
4. $b^a + c$

-3^2

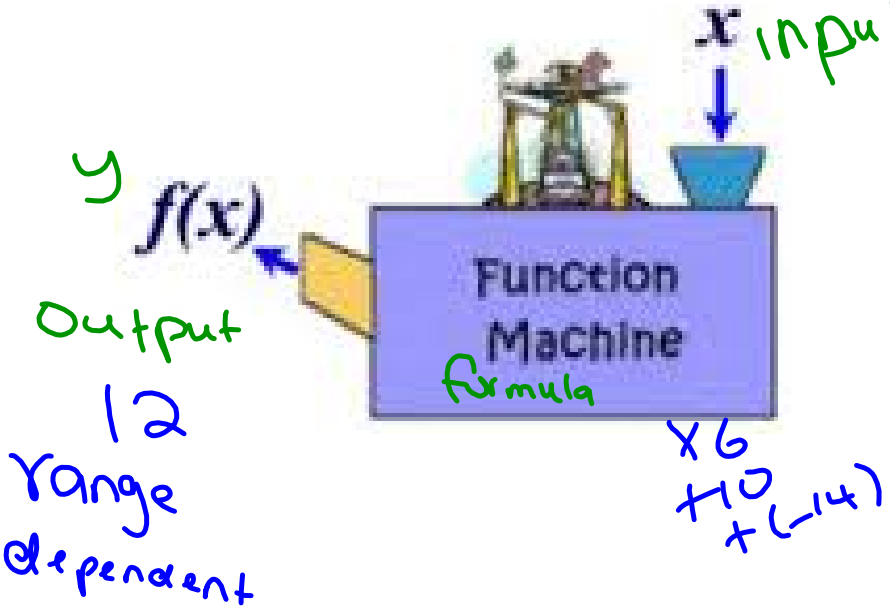
$9+8=17$

DeltaMath Code:

Teacher Code: 760933



Function Introduction

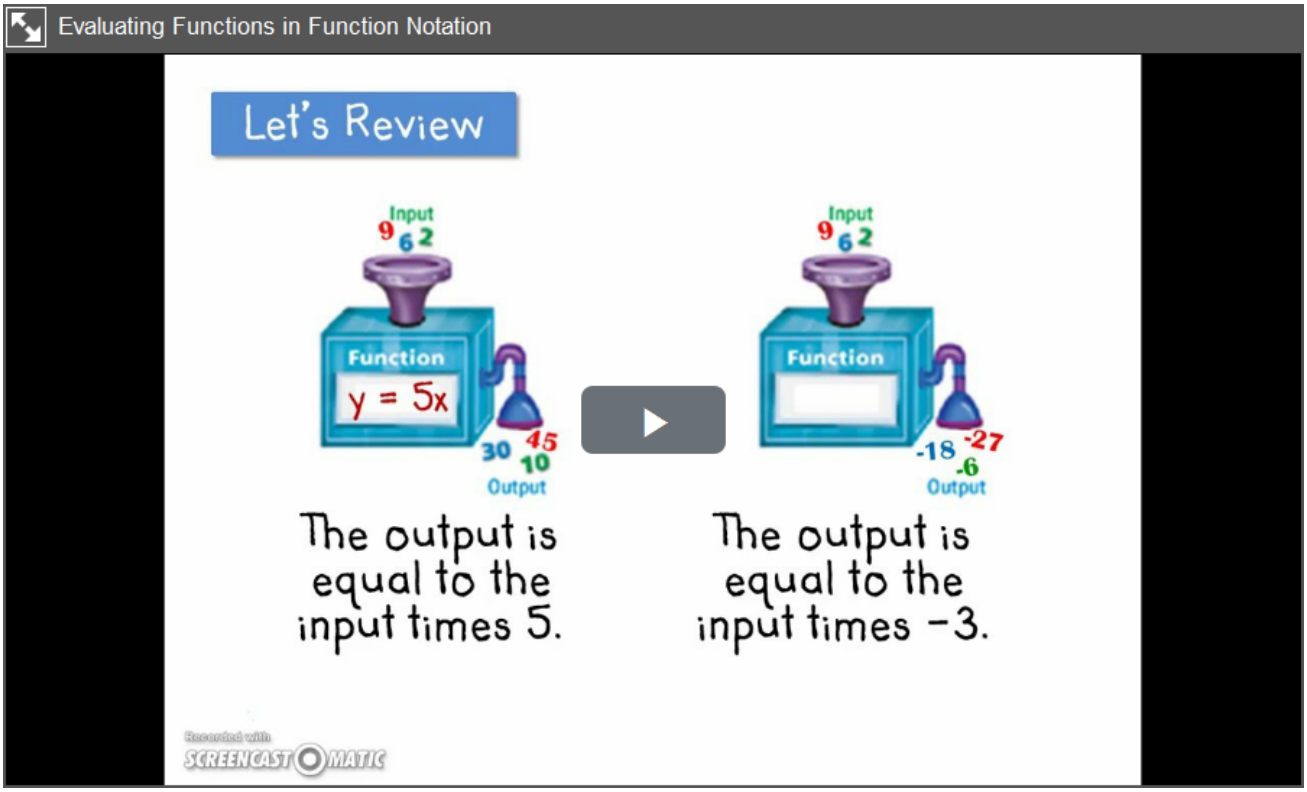


x input 2 domain Independent

Output 12 range dependent

formula x6 +10 +(-14)

Evaluating Functions in Function Notation



Essential Question: 1/5/18

How do you represent functions?

Function Notation

$$y = f(x)$$

Output — Name of Function — Input

We all mean the same!

Equation

$y = 2x - 3$

linear function: $F(x) = mx + b$ (m: slope, b: y-intercept)

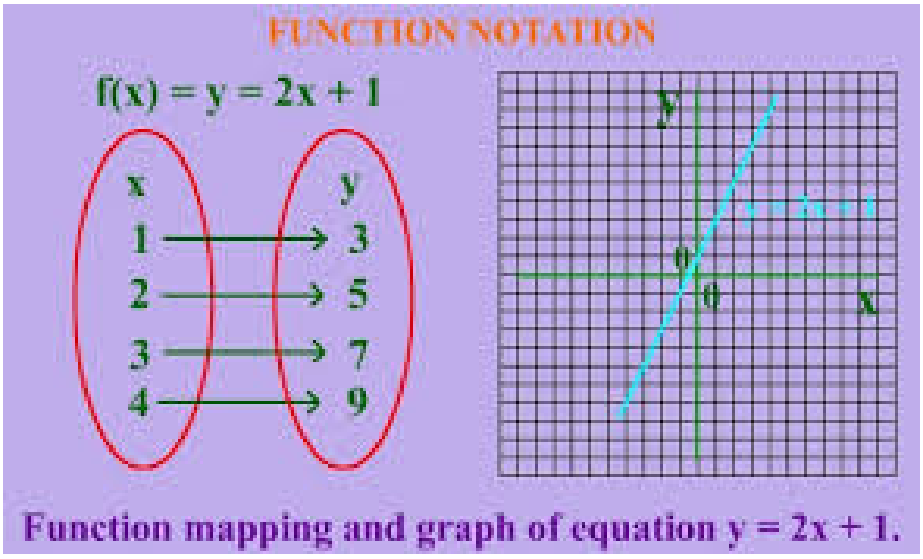
linear equation: $Y = mx + b$ (m: slope, b: y-intercept)

Function Notation

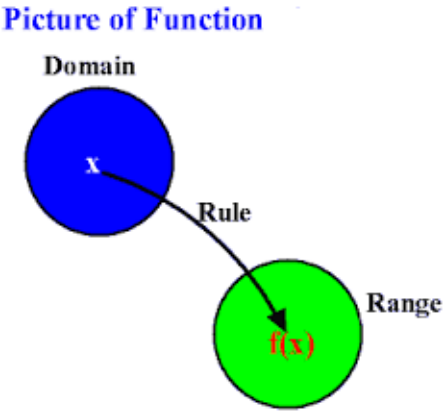
$f(x) = 2x - 3$

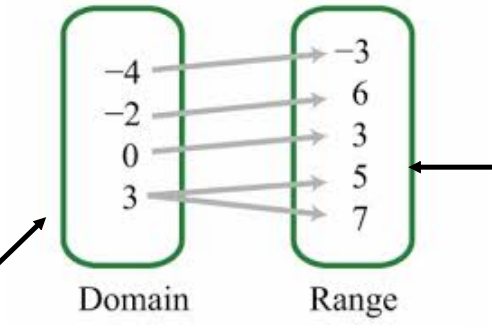
Function Notation PPT

Functions notation notes.ppt



A function pairs each element in one set, called the domain, with exactly one element in a second set, called the range.





dependent variable

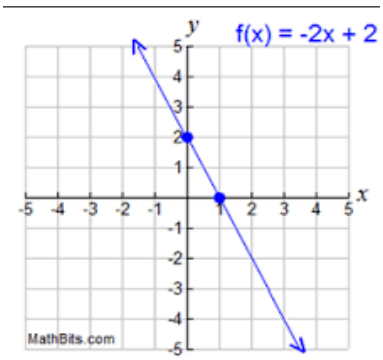
Independent variable

Are these functions?

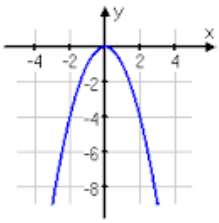
yes no

Why or why not?

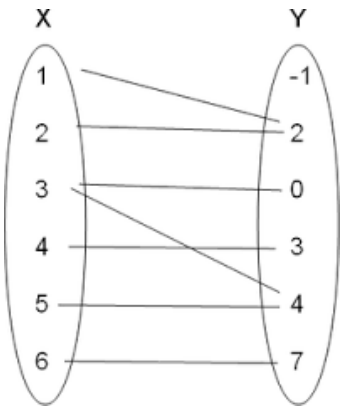
1.



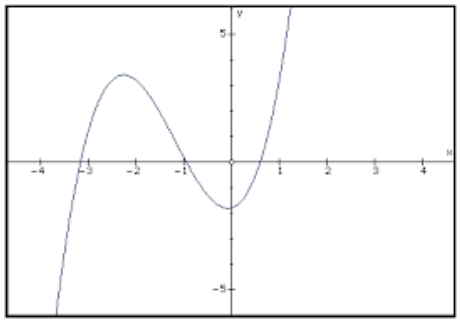
2.



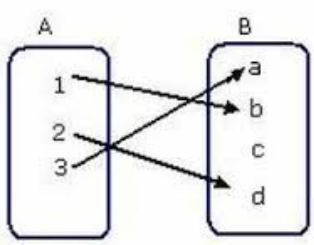
3.



4.



5.



6. (2,4), (3,6), (7, -4), (3, -2), (5,2)

7.

x	3	2	1	0	1	2	3
y	1	-2	2	4	-3	-2	-1

8.

x	y
-1	-5
0	-2
1	1
2	4
3	7

What is the difference in the two tables?

Which one is a function? Which is not?

X	Y
1	2
2	4
3	6
4	8
5	10
6	12

X	Y
1	2
2	4
1	5
3	8
4	4
5	10

Relation

Definition

A relation is a set of pairs of input (x) and Output (y) values.

Input
- X-values
- x-coordinates
- domain
- independent

Output
- y-values.
- y-coordinates
- range
- dependent.

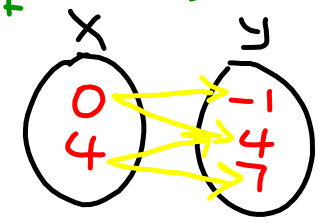
Characteristics

There are multiple ways to represent a relation:
- ordered pairs
- coordinate points on graph
- input/output table of values
- Mapping Diagram
- Equation
- words in a sentence.

Examples

{(4,7), (3,2), (0,0)}

input (x)	output (y)
-2	1
0	4
3	7



Non-Examples

X → variable

4 → constant

7x → expression

Function

Definition

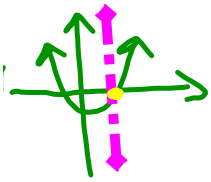
A Function is a relation where every input (x) has exactly one output (y).

Characteristics

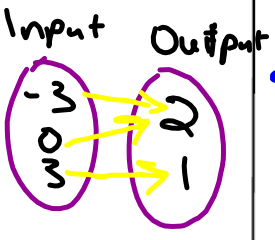
- X-coordinates does not repeat.
- Vertical Line Test: If you can draw a Vertical line through the graph and it touches the graph only once, then it is a function.

Examples

{(1,2),(2,2),(3,2),(4,2)}

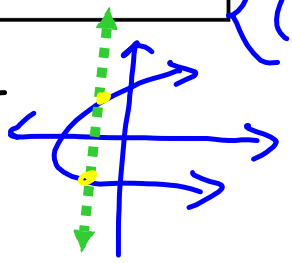


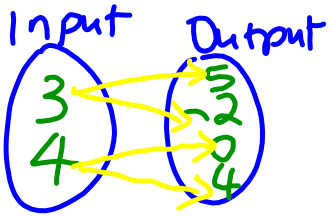
x	y
-1	4
0	2
1	4
2	2



Non-Examples

{(1,2),(1,3),(2,4)}





Class Work 1/5/18

Math Models Name _____
Worksheet 4.1 Relations and Functions

Relations Expressed as Ordered Pairs
Determine if the following relations are functions. Then state the domain and range.

1. {(1, -2), (-2, 0), (-1, 2), (1, 3)}

Function: No
Domain: 1, -2, -1, 1
Range: -2, 0, 2, 3

2. {(1, 1), (2, 2), (3, 5), (4, 10), (5, 15)}

Function: Yes
Domain: {1, 2, 3, 4, 5}
Range: {1, 2, 5, 10, 15}

3. $\left\{\left(17,\frac{15}{4}\right),\left(\frac{15}{4},17\right),\left(15,\frac{17}{4}\right),\left(\frac{17}{4},15\right)\right\}$

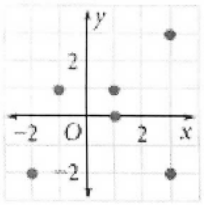
Function: Yes
Domain: $17, \frac{15}{4}, 15, \frac{17}{4}$
Range: $\frac{15}{4}, 17, \frac{17}{4}, 15$

4. $\left\{\left(-3,\frac{2}{5}\right),\left(-3,\frac{3}{5}\right),\left(\frac{3}{2},-5\right),\left(5,\frac{2}{5}\right)\right\}$

Function: No
Domain: $\{-3, \frac{3}{2}, 5\}$
Range: $\{\frac{2}{5}, \frac{3}{5}, -5, \frac{2}{5}\}$

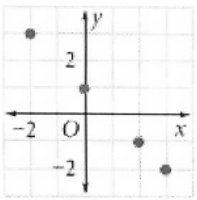
Relations Expressed as Graphing
Write each of the following as a relation, state the domain and range, then determine if it is a function.

5.

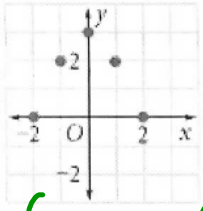


Relation: {(2, 2), (-1, 1), (1, 0), (1, 1), (3, 3), (3, -2)}
Domain: {-2, -1, 1, 3}
Range: {2, 1, 0, 1, 3, -2}
Function: No

6.



Relation: {(-2, 3), (0, 1), (2, -1), (3, -2)}
Domain: {-2, 0, 2, 3}
Range: {3, 1, -1, -2}
Function: Yes

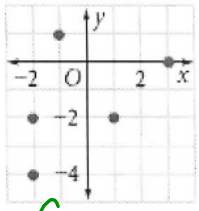
7. 

Relation: {(-2,0),(1,2),(0,3)(1,2)

Domain: {-2,-1,0,1,2}(2,0)

Range: {0,2,3,}

Function: Yes

8. 

Relation {(-2,2),(-2,4),(-1,1),(1,-2)}

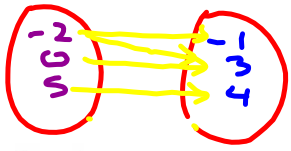
Domain: {-2,-1,1}

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

Function: No

Relations Expressed as Mappings
Express the following relations as a mapping, state the domain and range, then determine if is a function.

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

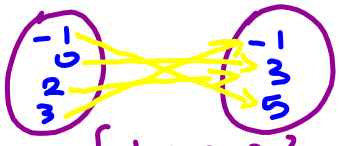


Domain: _____

Range: _____

Function: No

10. {(-1, 5), (0, 3), (2, 3), (3, -1)}

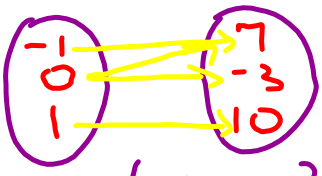


Domain: {-1,0,2,3}

Range: {-1,3,5}

Function: Yes

11. {(-1, 7), (0, -3), (1, 10), (0, 7)}

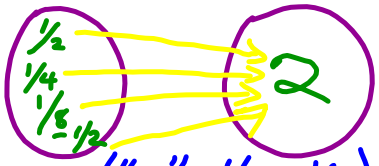


Domain: {-1,0,1}

Range: {-3,7,10}

Function: No

12. $\left\{\left(\frac{1}{2},2\right),\left(\frac{1}{4},2\right),\left(\frac{1}{8},2\right),\left(\frac{-1}{2},2\right)\right\}$

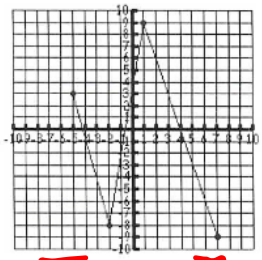


Domain: (½, ¼, ⅛, -½)

Range: {2}

Function: Yes

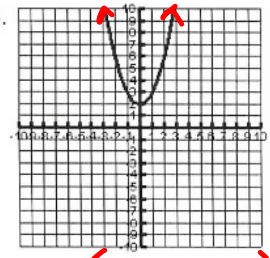
Determine if the graph is a function, then state the domain and range.

13. 

Domain: $[-5, 7]$

Range: $[-9, 9]$

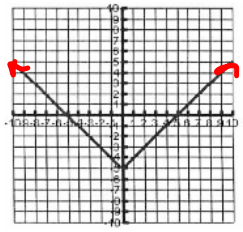
Function: Yes

14. 

Domain: $(-\infty, \infty)$

Range: $[2, \infty)$

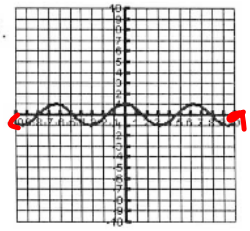
Function: Yes

15. 

Domain: $(-\infty, \infty)$

Range: $[-5, \infty)$

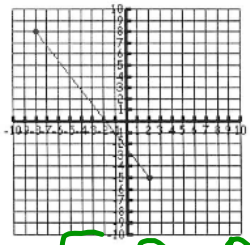
Function: Yes

16. 

Domain: $(-\infty, \infty)$

Range: $[-1, \infty)$

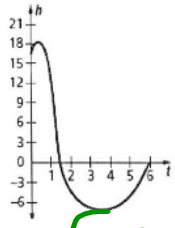
Function: Yes

17. 

Domain: $[-8, 2]$

Range: $[-5, 8]$

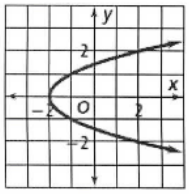
Function: Yes

18. 

Domain: $[0, 6]$

Range: $[-6, 17]$

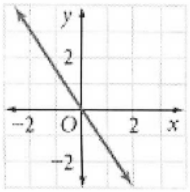
Function: Yes

19. 

D: [-2, ∞)

R: (-∞, ∞)

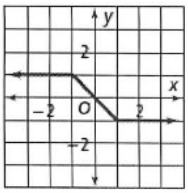
F: No

20. 

D: (-∞, ∞)

R: (-∞, ∞)

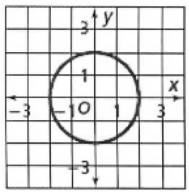
F: Yes

21. 

D: (-∞, ∞)

R: [-1, 1]

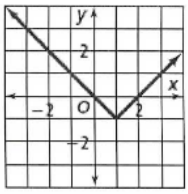
F: Yes

22. 

D: (-2, 2]

R: [-2, 2]

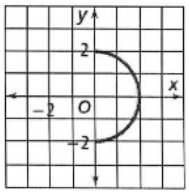
F: No

23. 

D: (-∞, ∞)

R: [-1, ∞)

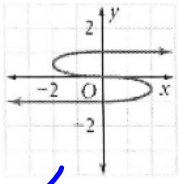
F: Yes

24. 

D: [0,

R: [-2, 2]

F: No

25. 

Domain: (-∞, ∞)

Range: [-1, 1]

Function: No

HW Assignment

Functions Practice Worksheet

Due on Monday 1/8/18

Functions Practice HW.docx

Student Led Closing 1/5/18

- How is a function different from a Relation?
- What are the words used to describe an input variable and an output variable?

Attachments

Functions notation.ppt

Functions Practice HW.docx

Functions notation notes.ppt