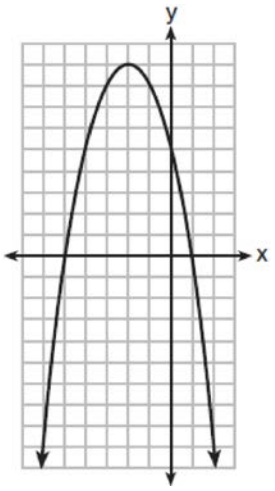
F.IF.A.1: Defining Functions 1

1 A relation is graphed on the set of axes below.



Based on this graph, the relation is

1) a function because it passes the horizontal line test
2) a function because it passes the vertical line test
3) not a function because it fails the horizontal line test
4) not a function because it fails the vertical line test

2 Which table represents a function?

1)

x	2	4	2	4
f(x)	3	5	7	9

2)

x	0	−1	0	1
f(x)	0	1	−1	0

3)

x	3	5	7	9
f(x)	2	4	2	4

4)

x	0	1	−1	0
f(x)	0	−1	0	1

3 Which table represents a function?

1)

x	y
2	–3
3	0
4	–3
2	1

2)

x	y
1	2
1	3
1	4
1	5

3)

x	y
–3	0
–2	1
–3	2
2	3

4)

x	y
–2	–4
0	2
2	4
4	6

4 Which table could represent a function?

1)

x	f(x)
1	4
2	2
3	4
2	6

2)

x	g(x)
1	2
2	4
3	6
4	2

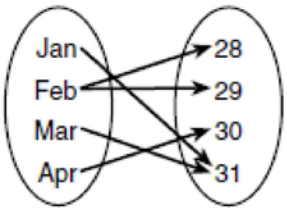
3)

x	h(x)
2	6
0	4
1	6
2	2

4)

x	k(x)
2	2
3	2
4	6
3	6

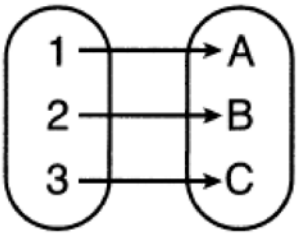
5 A mapping is shown in the diagram below.

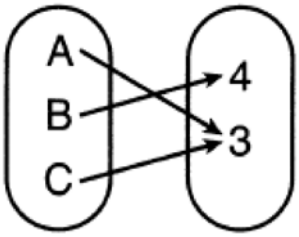


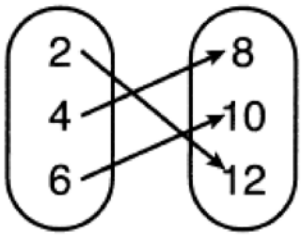
This mapping is

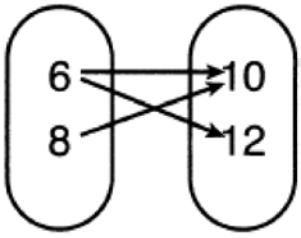
1) a function, because Feb has two outputs, 28 and 29
2) a function, because two inputs, Jan and Mar, result in the output 31
3) not a function, because Feb has two outputs, 28 and 29
4) not a function, because two inputs, Jan and Mar, result in the output 31

6 Which relation is *not* a function?

1) 

2) 

3) 

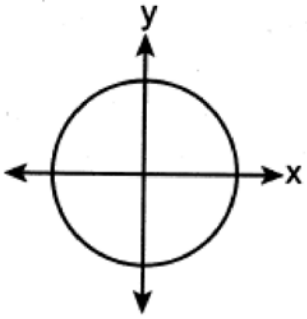
4) 

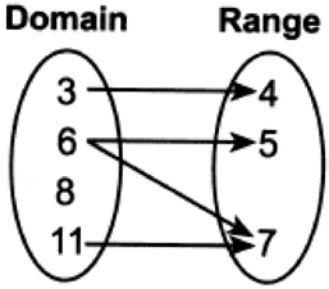
7 Which relation is a function?

1) $\{(1,3),(2,1),(3,1),(4,7)\}$

2)

Input	Output
−6	−2
−4	2
7	3
7	5

3) 

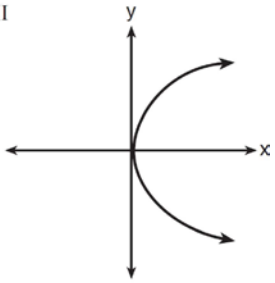
4) 

8 Which representations are functions?

I

x	y
2	6
3	–12
4	7
5	5
2	–6

III



II $\{(1,1),(2,1),(3,2),(4,3),(5,5),(6,8),(7,13)\}$

IV $y = 2x + 1$

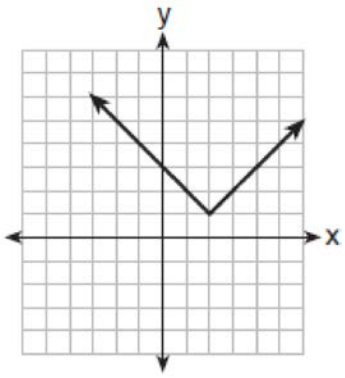
1) I and II
2) II and IV
3) III, only
4) IV, only

9 Which relation does *not* represent a function?

1)

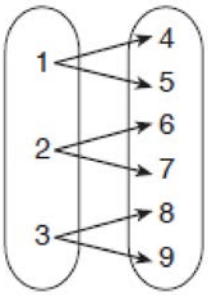
x	1	2	3	4	5	6
y	3.2	4	5.1	6	7.4	8.8

2)



3) $y = 3\sqrt{x+1} - 2$

4)



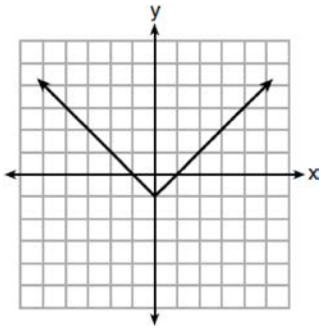
10 Which relation is *not* a function?

1)

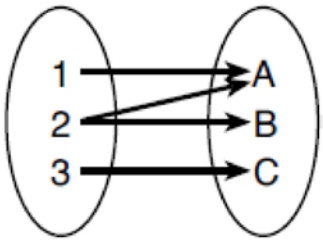
x	y
–10	–2
–6	2
–2	6
1	9
5	13

2) $3x + 2y = 4$

3)



4)



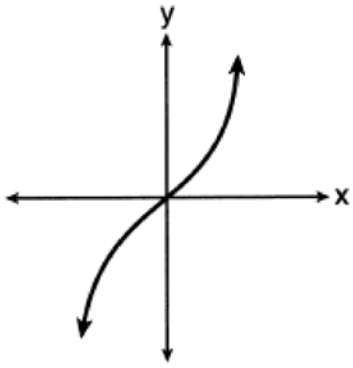
11 Which relation is a function?

1)

x	y
–1	1
0	0
1	1
1	2
2	4
3	9

2) $y = \begin{cases} x, & -1 < x \le 2 \\ x^2, & 2 \le x < 4 \end{cases}$

3)



4) $\{(0,1),(2,3),(3,2),(3,4)\}$

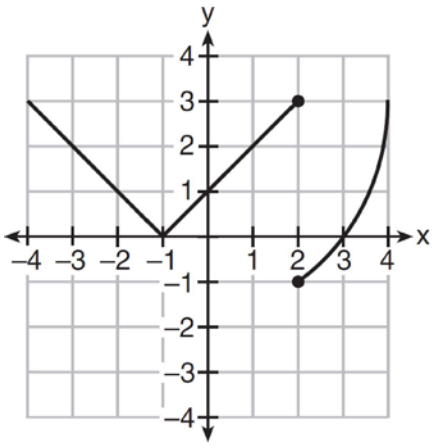
12 Given the relation $R = \{(-4,2),(3,6),(x,8),(-1,4)\}$
Which value of x would make this relation a function?
1) –4
2) –1
3) 3
4) 0

13 Given the relation: $\{(0,4),(2,6),(4,8),(x,7)\}$
Which value of x will make this relation a function?
1) 0
2) 2
3) 6
4) 4

14 A function is defined as $\{(0,1),(2,3),(5,8),(7,2)\}$. Isaac is asked to create one more ordered pair for the function. Which ordered pair can he add to the set to keep it a function?

1) $(0,2)$
2) $(5,3)$
3) $(7,0)$
4) $(1,3)$

15 Marcel claims that the graph below represents a function.



State whether Marcel is correct. Justify your answer.

16 A function is shown in the table below.

x	f(x)
–4	2
–1	–4
0	–2
3	16

If included in the table, which ordered pair, $(-4,1)$ or $(1,-4)$, would result in a relation that is no longer a function? Explain your answer.

17 The function $f(x)$ is shown in the table below.

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

State an appropriate value for m in the table, so that $f(x)$ remains a function. Explain your reasoning.

18 Explain why the relation shown in the table below is a function.

x	−1	0	1	2
y	2	4	4	5

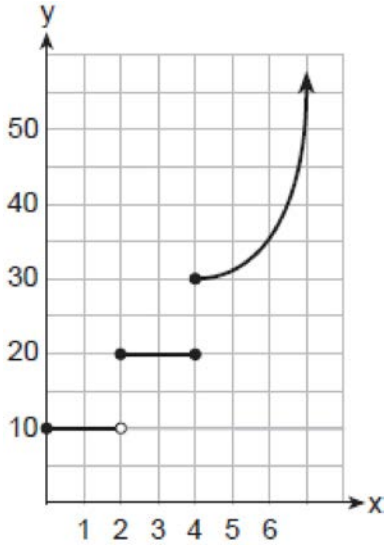
Complete the table below with values for both x and y so that this new relation is *not* a function.

x	−1	0	1	2	
y	2	4	4	5	

19 Given the relation $R = \{(-1,1),(0,3),(-2,-4),(x,5)\}$. State a value for x that will make this relation a function. Explain why your answer makes this a function.

20 The two relations shown below are *not* functions.

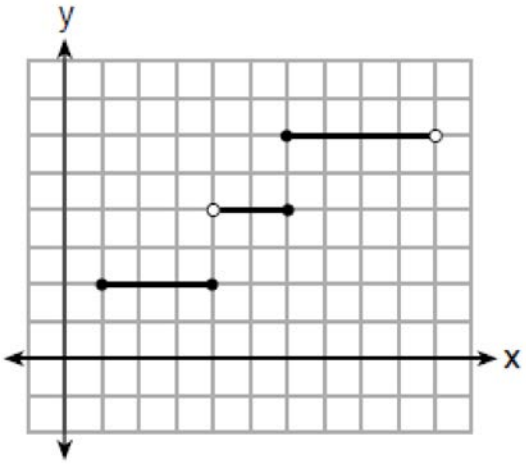
Relation I:



Relation II:
$\{(-5,-2),(-4,0),(-2,1),(-1,3),(-4,4)\}$

Explain how you could change each relation so that they each become a function.

21 Four relations are shown below.



I

$\{(1,2),(2,5),(3,8),(2,-5),(1,-2)\}$

II

x	y
–4	1
0	3
4	5
6	6

III

$y = x^2$

IV

State which relation(s) are functions. Explain why the other relation(s) are *not* functions.

22 The function f has a domain of $\{1,3,5,7\}$ and a range of $\{2,4,6\}$. Could f be represented by $\{(1,2),(3,4),(5,6),(7,2)\}$? Justify your answer.

23 Nora says that the graph of a circle is a function because she can trace the whole graph without picking up her pencil. Mia says that a circle graph is *not* a function because multiple values of x map to the same y-value. Determine if either one is correct, and justify your answer completely.

F.IF.A.1: Defining Functions 1
Answer Section

1 ANS: 2 REF: 011804ai
2 ANS: 3 REF: 061504ai
3 ANS: 4 REF: 081902ai
4 ANS: 2 REF: 012004ai
5 ANS: 3 REF: 061709ai
6 ANS: 4 REF: 062104ai
7 ANS: 1 REF: 012305ai
8 ANS: 2 REF: 081511ai
9 ANS: 4 REF: 011907ai
10 ANS: 4 REF: 061903ai
11 ANS: 3 REF: 062210ai
12 ANS: 4 REF: 082204ai
13 ANS: 3 REF: 012402ai
14 ANS: 4 REF: 061811ai
15 ANS:
No, because the relation does not pass the vertical line test.

REF: 011626ai
16 ANS:
$(-4, 1)$, because then every element of the domain is not assigned one unique element in the range.

REF: 011527ai
17 ANS:
7, as for each value of x, there is a unique value of y.

REF: 012527ai
18 ANS:

x	−1	0	1	2	2
y	2	4	4	5	4

For every value of x, there is a unique value of y.

REF: 082427ai
19 ANS:
x may be any value other than $-2, -1, 0$, so that for any value of x, there is a unique y.

REF: 062427ai
20 ANS:
I: Change $(4, 30)$ to an open circle. II: Remove $(-4, 4)$.

REF: 062330ai

21 ANS:
III and IV are functions. I, for $x = 6$, has two y-values. II, for $x = 1,2$, has two y-values.

REF: 081826ai

22 ANS:
Yes, because every element of the domain is assigned one unique element in the range.

REF: 061430ai

23 ANS:
Neither is correct. Nora's reason is wrong since a circle is not a function because it fails the vertical line test. Mia is wrong since a circle is not a function because multiple values of y map to the same x-value.

REF: 011732ai