

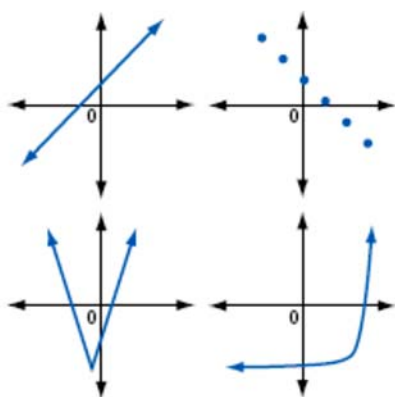
4.5 Functions

These 8 relations are functions.

x	y	x	y
5	10	11	3
6	15	21	3
7	20	31	3

$\{(-2, -5), (0, 4), (2, 13), (4, 22)\}$

$\{(10, 10), (12, 10), (14, 12), (16, 12)\}$

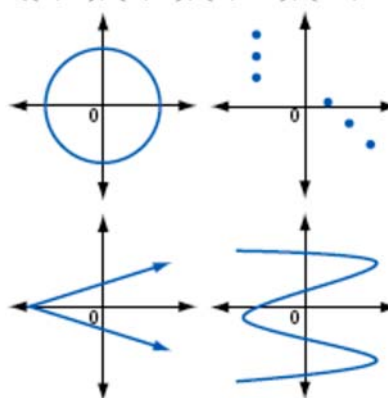


These 8 relations are not functions.

x	y	x	y
6	10	3	11
6	15	3	21
7	20	3	31

$\{(10, 10), (12, 10), (12, 14), (12, 16)\}$

$\{(7, 5), (7, 8), (9, 11), (11, 14)\}$



Function:

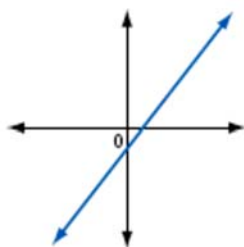
- A relation in which each value of the independent variable is associated with exactly one value of the dependent variable
 - Each input only produces a single output value
 - For each value in the domain there is only one connected value in the range
- All functions are relations but NOT all relations are functions

Function Notation:

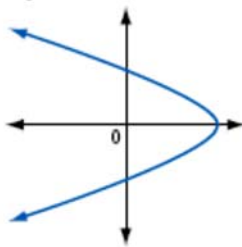
- Symbolic notation used for writing a function

Ex. For each pair of relations, decide which relation is a function and which is not a function. Explain your choice.

a) A



B



Vertical Line Test: the graph of a function may intersect with any vertical line at MOST once

b) C

x	y
2	5
2	7
4	9
6	11

D

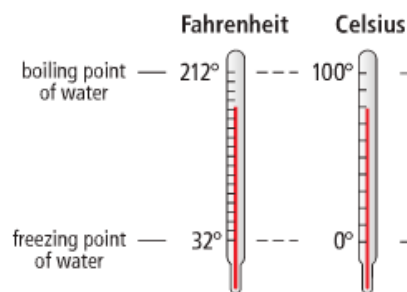
x	y
-3	3
-2	4
-1	3
0	4

c) E $\{(1, 1), (2, 2), (3, 3), (4, 4)\}$

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

Ex. The function $F(C) = 1.8C + 32$ is used to convert a temperature in degrees Celsius ($^{\circ}C$) to a temperature in degrees Fahrenheit ($^{\circ}F$).

a) Determine $F(25)$. Explain your answer.

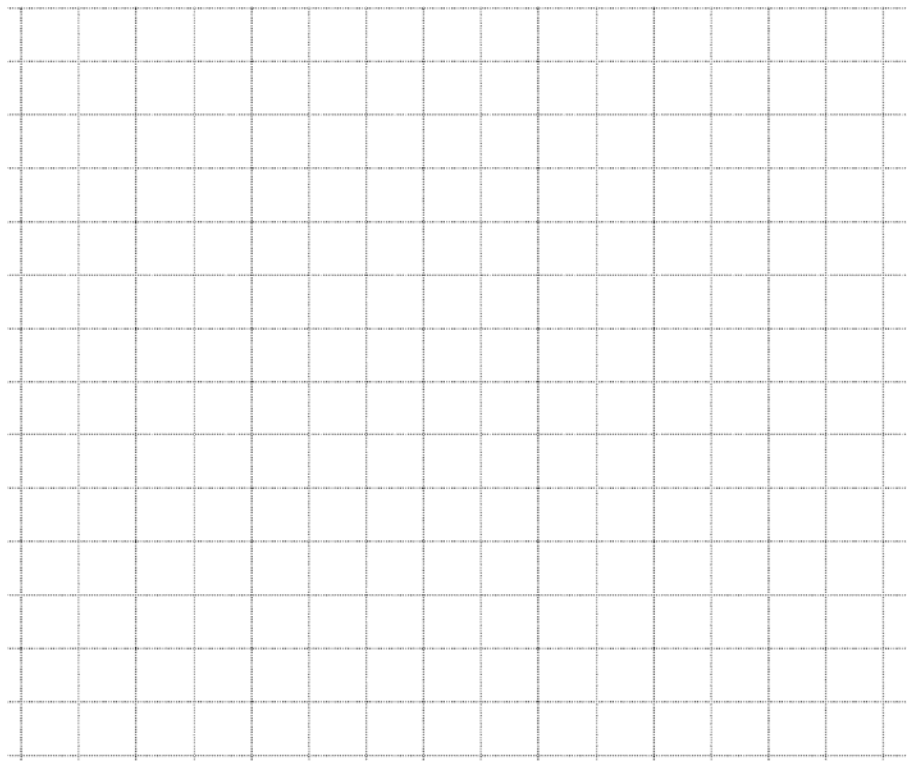


b) Determine C so that $F(C) = 100$. Explain your answer.

Ex. Skye has a cell phone plan for a monthly fee of \$20 plus 25¢ for each text message to or from a number not on a list of favourites.

a) Write the relation modeling the monthly bill in function notation using C as the name of the function & n as the number of additional text messages.

b) Make a table of values. Graph the function if Skye sends up to four additional text messages.



c) If Skye's cell phone bill for a certain month is \$22.25, how many additional text message charges are there?