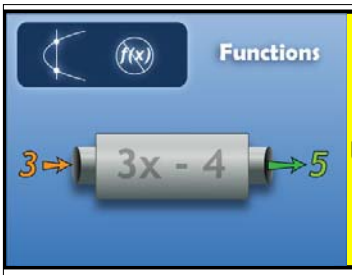
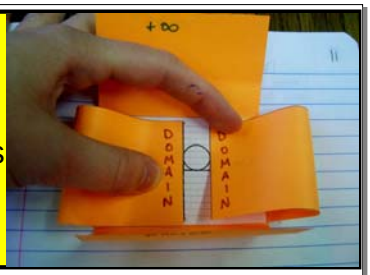


Unit 4: Relations and Functions

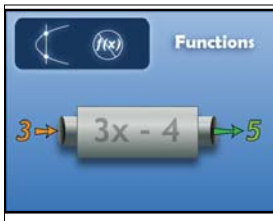


4.6 Functions

A function is a special type of relation in which each element of the domain has only one element in the range.

Vertical Line Test:

If every vertical line drawn intersects the graph exactly once, then the relation is a function.



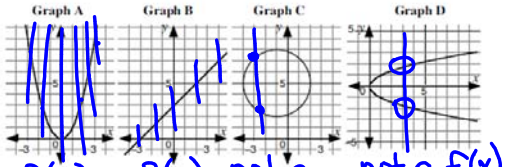
How we can determine which relations are functions by...

function: f(x)

a) a graph

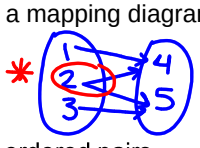
V.L.T.

Each of the following is the graph of a relation.



f(x) f(x) not a f(x) not a f(x)

b) a mapping diagram

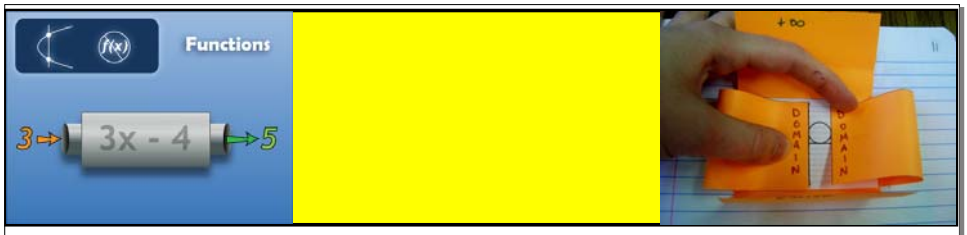


cannot have 2 arrows coming from the same input.

c) ordered pairs

(1,2) (1,4)
(2,2)

cannot have repeat x-values

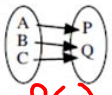


Determine which of the following are functions. Explain your answers.

a) (5,8), (6,7), (−5,3), (2,3), (6,8) — 6 ✗ 6

b) (3,3), (2,3), (4,5), (−3,2) — f(x)

c)

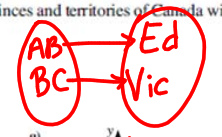


f(x)

d)

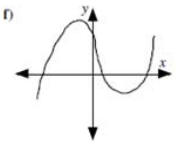
✗

e) The relation connecting the provinces and territories of Canada with their capital cities.



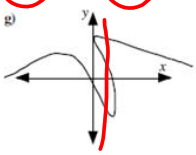
f(x)

f)

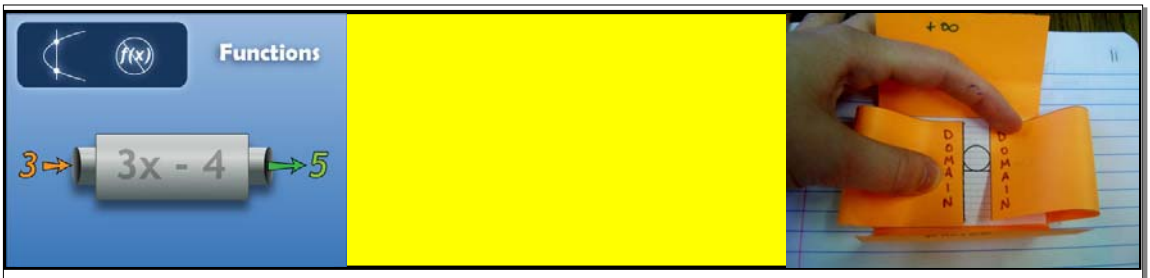


f(x)

g)



✗



Ex.) In the function y = 2x-5, the domain is {-1, 0, 1}. What is the range?

X-values Y-values

$y = 2(-1) - 5$

$y = -7$

$y = 2(0) - 5$

$y = -5$

$y = 2(1) - 5$

$y = -3$

R: {-7, -5, -3}