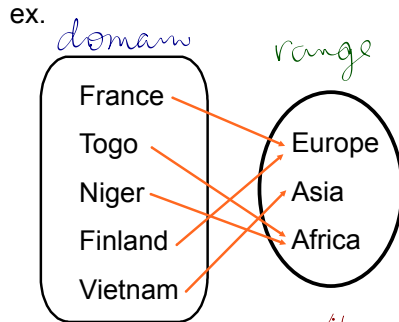


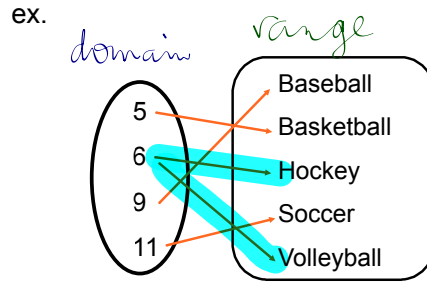
5.2 Properties of Functions

* In a **relation**, the set of the **first** elements are called the **domain**; the set of the **second** elements are called the **range**.

* A **function** is a relation where each element of the domain is associated with **exactly one element of the range**.



"is a country in"
 (S) a function



"is the # of players on the surface"

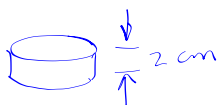
(X) NOT a function

(y) * The **domain** represents the set of **input values**. The **range** represents the set of **output values**. On the cartesian plane, the values on the **y-axis** depend on the **input values** on the **x-axis**. Thus, the **input values** are **independent** of the output values.

* For functions with numeric values, we use **formulas**

ex. area of a disc

$$A(r) = 2\pi r^2 + 2\pi r h$$



$$A(r) = 2\pi r^2 + 2\pi r(2)$$

$$A(r) = 2\pi r^2 + 4\pi r$$

$$A(r) = 2\pi r(r + 2)$$

let $r = 6$ cm

$$A(6) = 2\pi(6)(6 + 2)$$

↑ "find Area when $r = 6$ "

$$A(6) = 12\pi(8)$$

$$A(6) = 96\pi \text{ units}^2$$

Associations	
x	y
input	output
domain	range
indep.	dependent
horizontal	vertical
abscissa	ordinate
time	distance, speed, height, temp...

function notation does not mean $A \times r$... it means Area (A) is a function of radius (r) \Rightarrow in other words: Area depends on radius

ex// $h(t) = -4.9t^2 + 3t + 1$

ex. The equation $V = -0.08d + 50$ represents the volume, V litres, of gas remaining in a vehicle's tank after travelling d kilometres. The gas tank is not refilled until it is empty.

a) Describe the function. *a car has a 50L tank and burns 0.08 L/km*
Write the equation in function notation.

b) Determine the value of $V(600)$.
What does this number represent?

$V(d) = -0.08d + 50$

c) Determine the value of d when $V(d) = 26$.
What does this number represent?

$b) V(600) = -0.08(600) + 50$
 $= -48 + 50$
 $= 2$

↳ when the volume = 26L, how far have we driven?

$V(d) = -0.08d + 50$

$-26 = -0.08d + 50$
 -50
 $-24 = -0.08d$
 $\frac{-24}{-0.08} = \frac{-0.08d}{-0.08}$

$d = 300 \text{ km}$

S
A
M
D
E
B

CHECK YOUR UNDERSTANDING

3. The equation $C = 25n + 1000$ represents the cost, C dollars, for a feast following an Arctic sports competition, where n is the number of people attending.

a) Describe the function.
Write the equation in function notation.

*a) $C(n) = 25n + 1000$
The cost is 25\$/person + a fixed fee of \$1000*

b) Determine the value of $C(100)$. What does this number represent?

$b) C(100) = 25(100) + 1000$
 $= 2500 + 1000$
 $= 3500 \$$

c) Determine the value of n when $C(n) = 5000$. What does this number represent?

c) How many can attend on a budget of \$5000?
 $5000 = 25n + 1000$
 -1000 -1000

Quiz in 2 days

Homefun: Pg. 270 # 4-6, 9-12, 14-17, 19-23 + Assess your Understanding Pg. 275

$4000 = 25n$
 $\frac{4000}{25} = \frac{25n}{25}$
 $160 = n$