5.5 Graphs of Functions and Relations

inputs ↓

* The domain of a function is the set of values attributed to the independent variable (the horizontal axis).
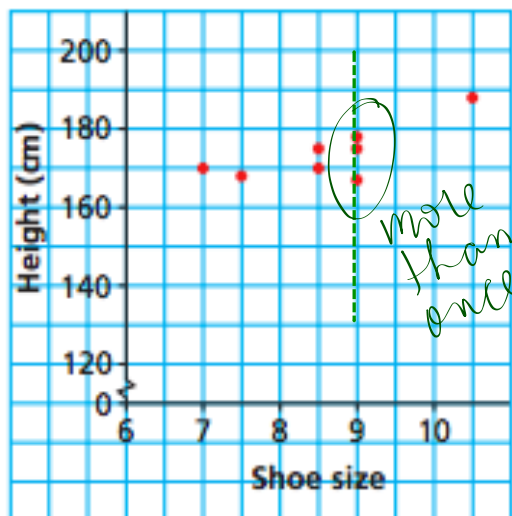
outputs ↘

* The range of a function is the set of values attributed to the dependent variable (the horizontal axis).

can't be divided ↘

* When the domain of a function is restricted to a set of discrete values, the points on its graph are not connected.   *we could use a dotted line*

* The Vertical Line Test (VLT): when considering the graph of a function the VLT will be satisfied. To satisfy the VLT, a vertical line will never cross/touch the graph of the function at more than one point.

ex. Determine the domain and range and indicate whether each is a function or not.
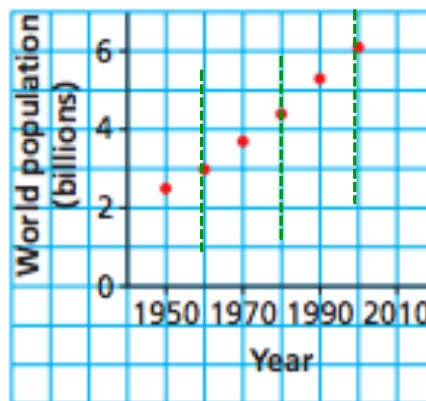
a) **Height against Shoe Size**

more than once

Not a function
⟹ fails the VLT
D: {7, 7.5, 8.5, 9, 10.5}
R: {167, 168, 170, 175, 178, 188}

b) **World Population**

Function ⟹ passes the VLT
D: {1950, 1960, 1970, 1980, 1990, 2000}
R: {2.5, 3, 3.7, 4.3, 5.2, 6}

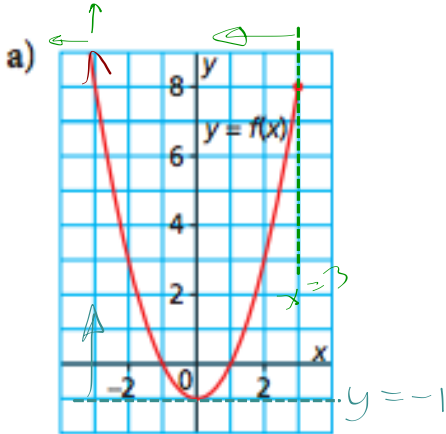ex. Determine the domain and range of the graph of each function.

a)

$y = f(x)$

$x = 3$

$y = -1$

$D = \{x \in \mathbb{R} \mid x \leq 3\}$

"is an element of"

"whereby"

real number set
↳ since the curve is continuous

$R = \{y \in \mathbb{R} \mid y \geq -1\}$

b)

$y = g(x)$
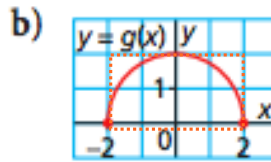
solid end points

$D: \{x \in \mathbb{R} \mid -2 \leq x \leq 2\}$

$R: \{y \in \mathbb{R} \mid 0 \leq y \leq 2\}$

"f of x"
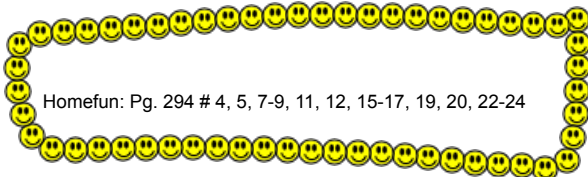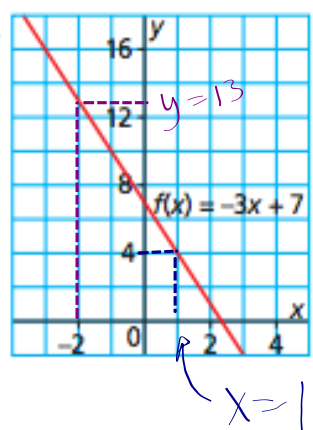
ex. Here is a graph of the function $f(x) = -3x + 7$.

y ⟶ or $y = -3x + 7$

a) Determine the range value when the domain value is -2. $y = 13$

x

b) Determine the domain value when the range value is 4. $x = 1$

y

$y = 13$

$f(x) = -3x + 7$

$x = 1$

5.1 - 5.5 ⟶ Theoday

Quiz ~~tomorrow~~

Homefun: Pg. 294 # 4, 5, 7-9, 11, 12, 15-17, 19, 20, 22-24