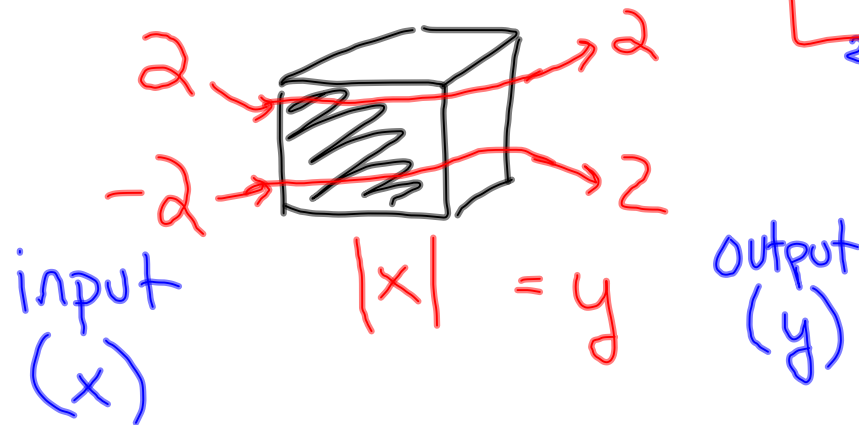
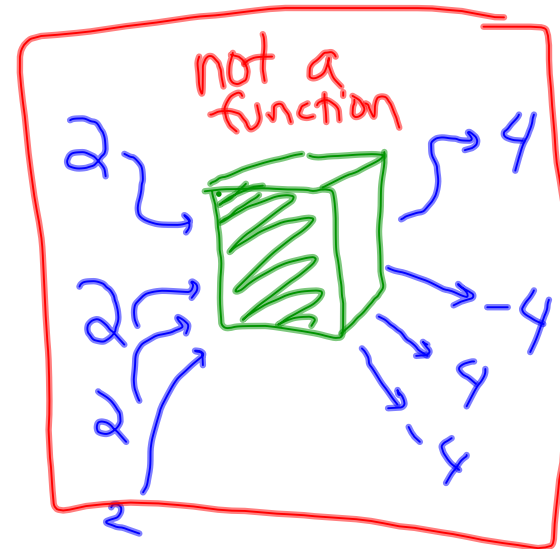
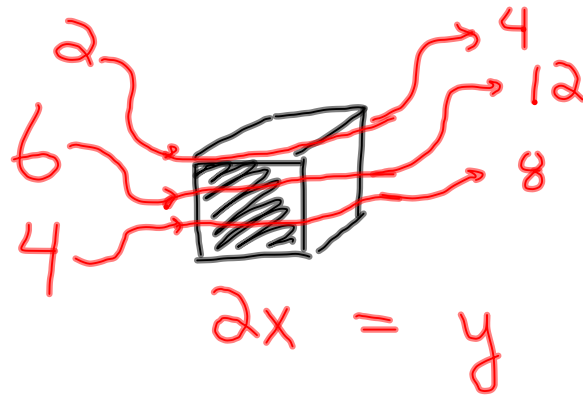


Functions:

- Equations with two variables (x and y)
- Written in the form: $y = \dots x \dots$
 - $x + 5$
 - $2x + 7$
 - $2x^4 + 7x^2 - 2x + 11$
- For every possible value of x ,
there is only one possible resulting y
(if you use the same x , you will always
get the same y)

Think about functions like mathematical "machines": they take a number, do math with it, and spit out a different number.



a function has an input of $x = 7$
and an output of 12.

→ give me $y = 12$ an example of
a function that would do this

$$\begin{array}{l} y = x + 5 \quad \left\{ \begin{array}{l} \text{or } y = (x-1) \cdot 2 \\ 12 = 7 + 5 \\ 12 = (7-1) \cdot 2 \end{array} \right. \\ \hline \text{or} \\ y = 13 - 1 + 0 \cdot x \\ y = 12 \end{array}$$

Some functions have a limited # of x values (inputs) that will work.

The list of possible x -values is called the "domain"

$\boxed{1, 2, 7, 11, 31}$ — domain

$$y = \frac{7}{x} \quad \text{domain: } x \neq 0$$

$$y = 4x \quad \text{domain: ALL real \#s}$$

The possible output values of a function are called the range.

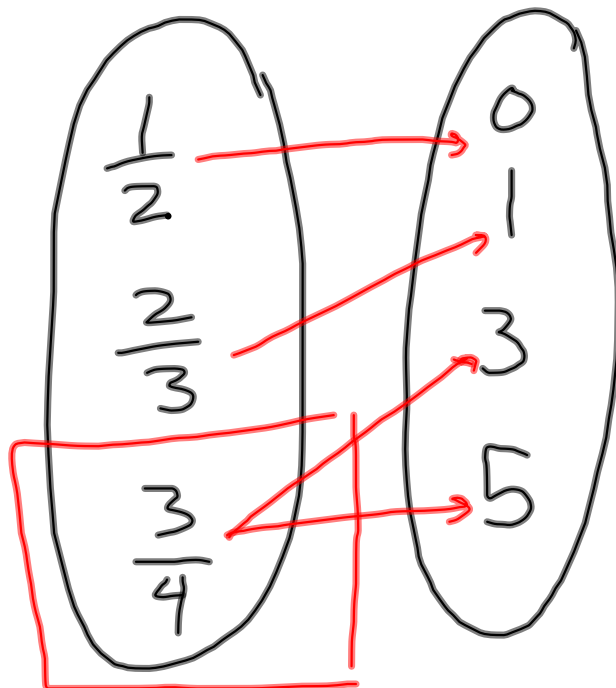
$$y = |x| \quad \text{range: all real \#s} > 0$$

domain	range
2	7
4	6
11	21
22	100
31	

p. 38, 4-18 (even), 24

⑦

~~$y = x \dots$~~



NOT
A
FUNCTION

⑧

$y = \dots x \dots$

in	out
7	13
11	8
21	13
35	20

FUNCTION

$$y = \dots \times \dots$$

"y is a function of x"

(y's value is determined by x's value)

(24) # books = x

(a) total cost = y

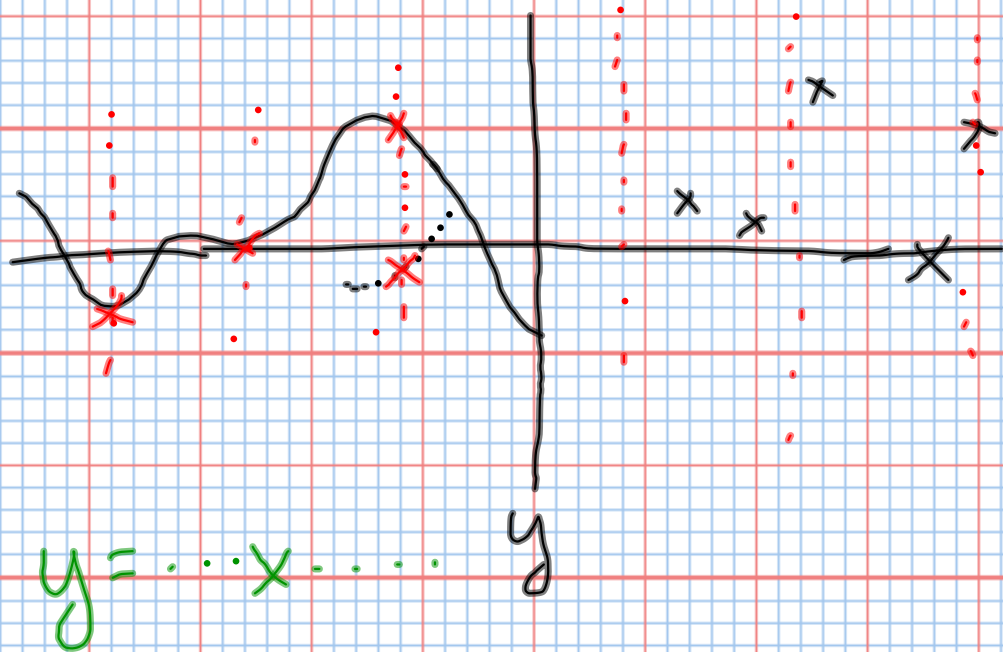
total cost is a function of # books

(b) total cost = # books \cdot 0.75

$$y = 0.75x$$

(c)

inputs	outputs
0	0
1	.75
2	1.5
3	2.25
4	3.00
5	3.75



(x) in	(y) out
7	2
10	1
13	7
20	5

true functions — can be graphed on
an x-y axis — a vertical line
will only hit the graph once (at most)

h/w p. 38 4-18 (even), 24

p. 46 2-8 (even), 16, 19