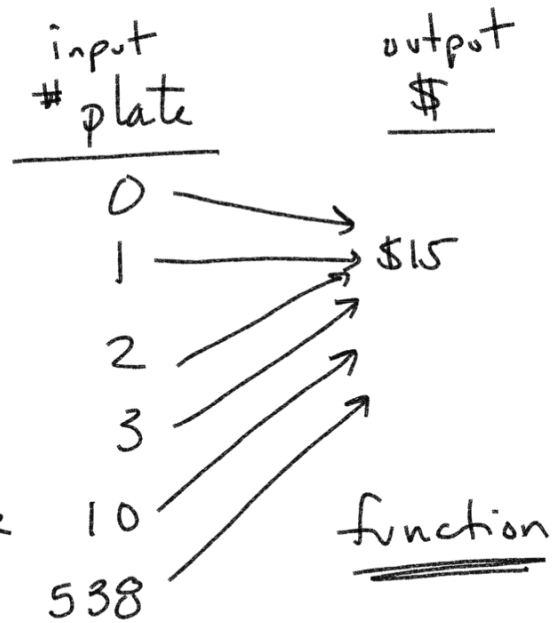
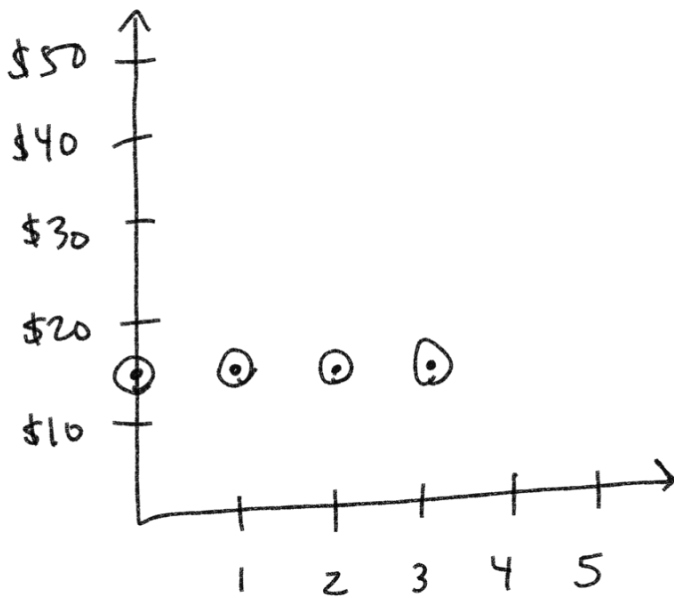
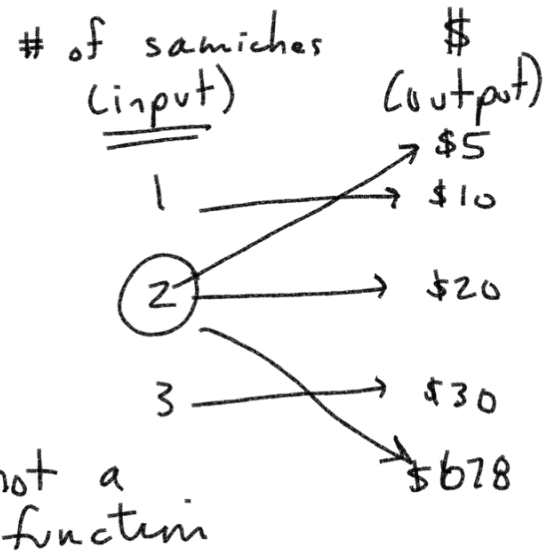
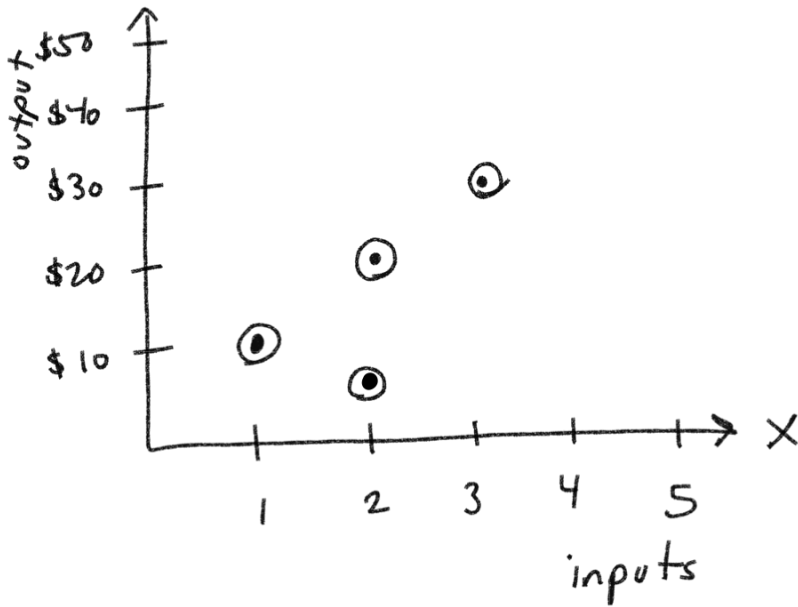


Functions → Predictable

Each input must have one, and only one, output



multiple inputs can have the same output

①

input x	output y
1	8
2	10
3	12
4	

function

②

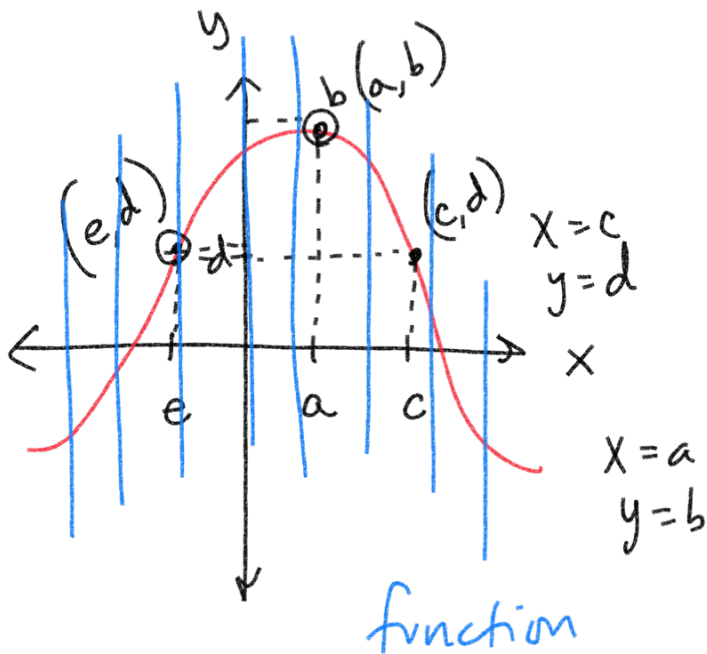
input x	output y
1	8
2	10
3	12
3	

not function

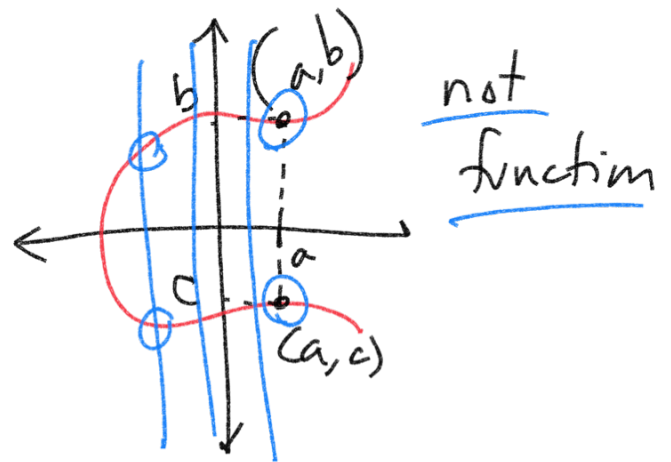
① $(1,2), (2,6), (3,8)$ function

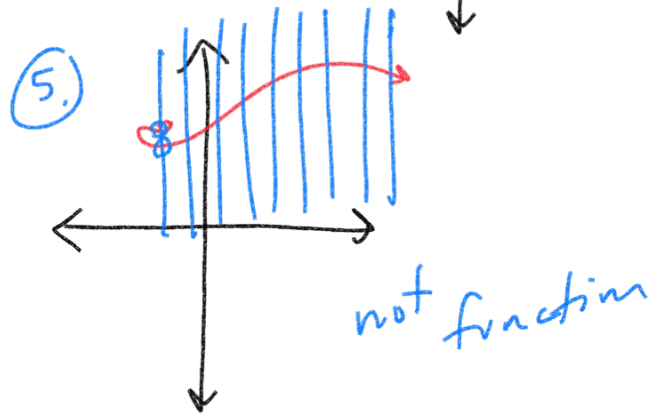
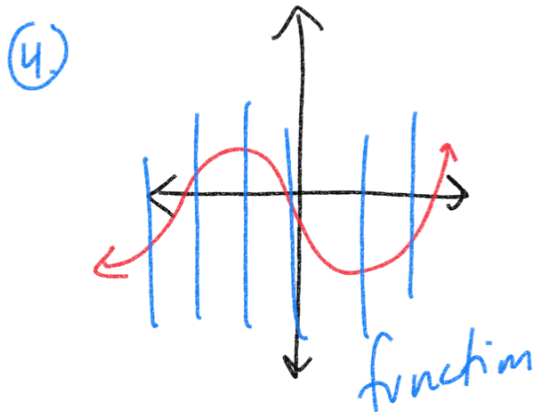
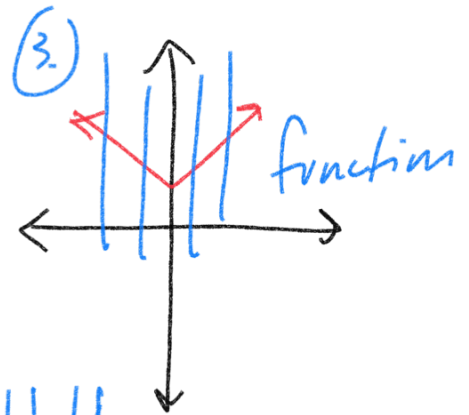
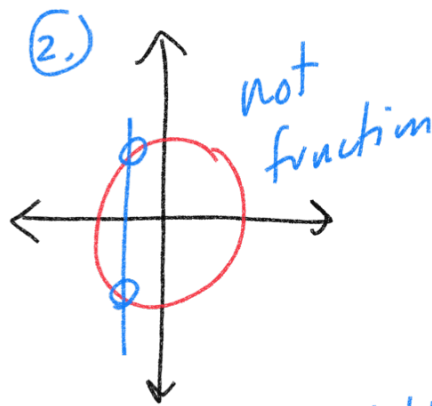
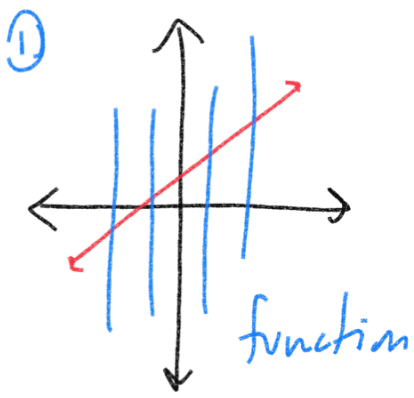
$x \rightarrow$ inputs
 $y \rightarrow$ outputs
 (x,y)

② $(2,8), (3,12), (3,6), (4,14)$ not function



Vertical Line Test





1.) $\begin{matrix} x & y \\ (-1, 8) & (-3, 8) \\ (-5, 8) & (7, 8) \end{matrix}$

Domain: $\{-1, -3, -5, 7\}$

Range: $\{8\}$

Function

Domain \rightarrow x values

Range \rightarrow y values

2.) $(0, 7), (1, 9), (2, 11), (3, 13)$

Domain: $\{0, 1, 2, 3\}$

Range: $\{7, 9, 11, 13\}$

Function

$$y = -2x^2 - 5x$$

$h(x)$ "function" h with respect to x "

$$h(x) = -2x^2 - 5x$$

$$x = -6 \quad h(-6) = -2(-6)^2 - 5(-6)$$

\uparrow input \uparrow input
 \uparrow input \uparrow input

$$-2(36) - 5(-6)$$

$$-72 + 30 = -42$$

output

input $\rightarrow -6$
output $\rightarrow -42$

$(-6, -42)$

$$f(x) = 3x - 4$$

$$y = mx + b$$

\uparrow slope \uparrow y-intercept

$$y = mx + b$$

$$y = 3x - 4$$

$$f(x) = 3x - 4$$

$$f(-2) = 3(-2) - 4 = -6 - 4 = -10$$

$(-2, -10)$

slope = 3

y-int = -4

slope = $\frac{\text{rise}}{\text{run}}$

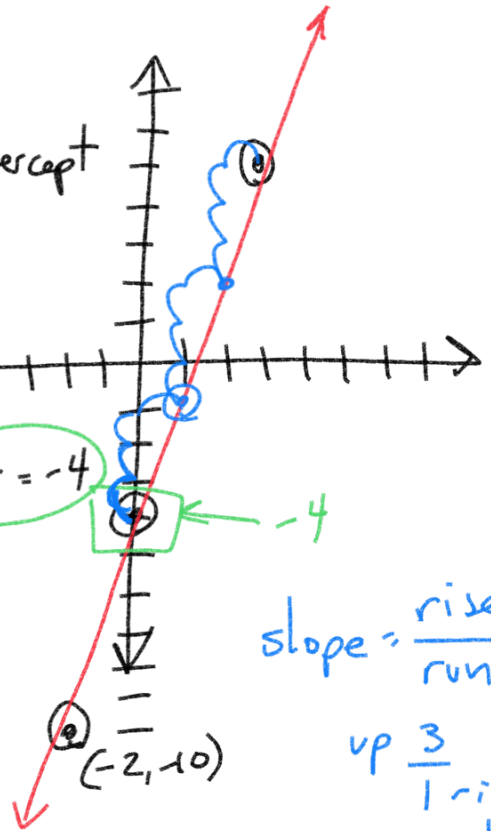
up $\frac{3}{1}$ right

$$f(0) = 3(0) - 4 = -4$$

$(0, -4)$

$$f(3) = 3(3) - 4 = 9 - 4 = 5$$

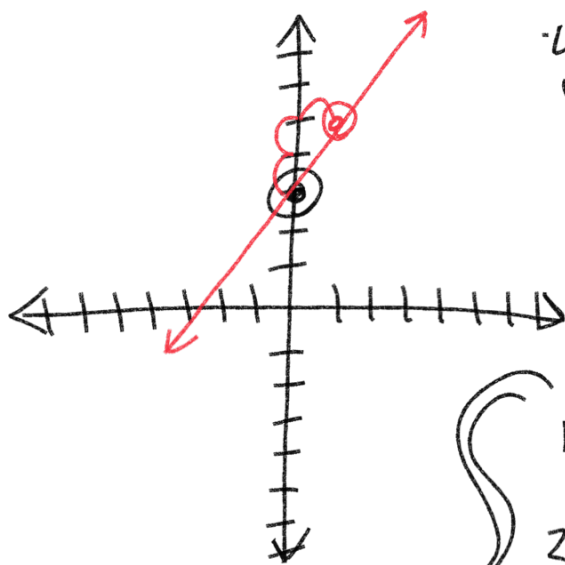
$(3, 5)$



$$f(x) = 2x + 3$$

$$\text{slope: } 2 \quad \frac{2 \text{ up}}{1 \text{ right}}$$

$$\text{y-int: } 3$$



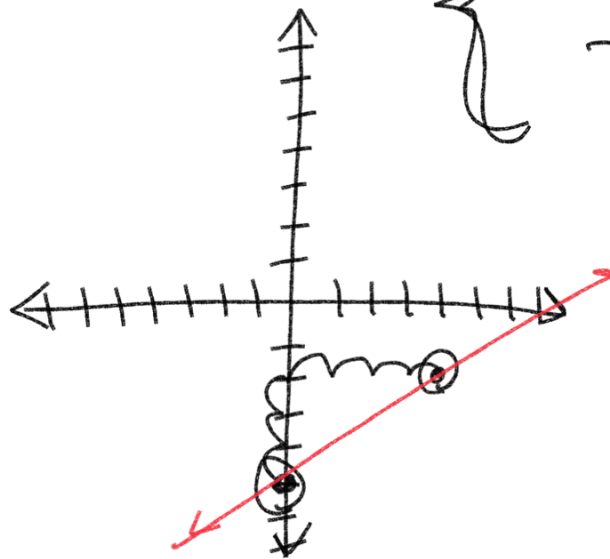
$$y = mx + b$$

\uparrow slope \uparrow y-int

- 1.) Plot y-int
- 2.) Use slope to find second point

$$f(x) = \frac{3}{4}x - 5$$

$$\text{slope} = \frac{3}{4} \quad \frac{3 \text{ up}}{4 \text{ right}}$$



standard form

$$2x + 5y = 10$$

use intercepts

$$x=0 \quad 2x + 5y = 10$$

$$y=2 \quad \frac{5y}{5} = \frac{10}{5}$$

$$(0, 2) \quad y=2$$

$$y=0 \quad 2x + 5y = 10$$

$$\frac{2x}{2} = \frac{10}{2}$$

$$x=5 \quad (5, 0)$$

$$2x + 5y = 10$$

$$-2x \quad -2x$$

$$\frac{5y}{5} = \frac{-2x + 10}{5}$$

$$y = -\frac{2}{5}x + 2$$

