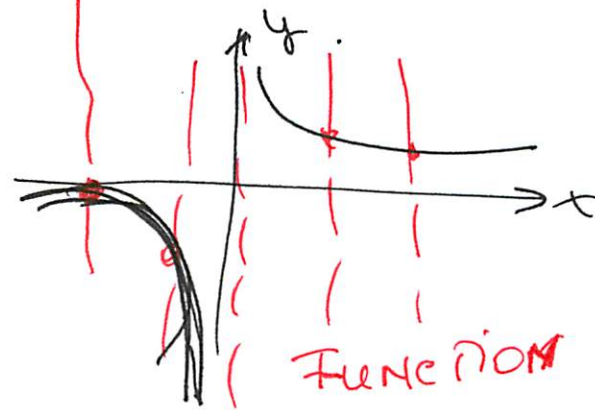
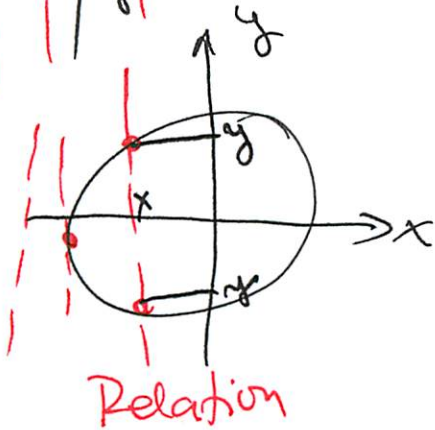
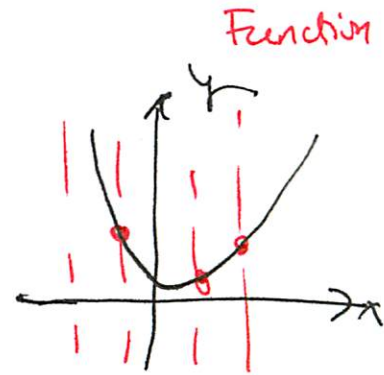
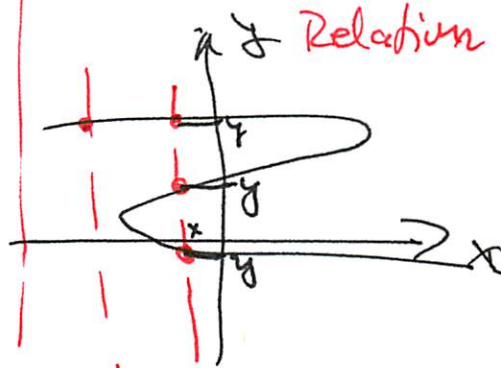
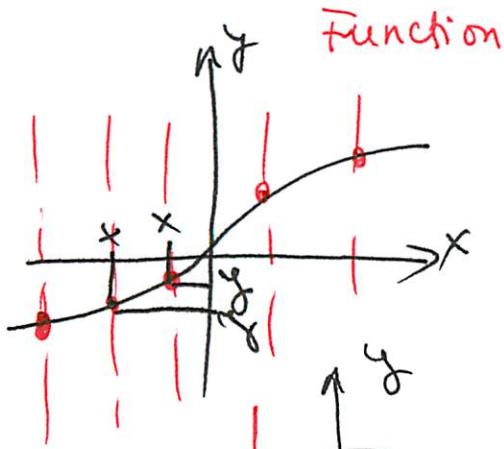


# The Graph of a Function

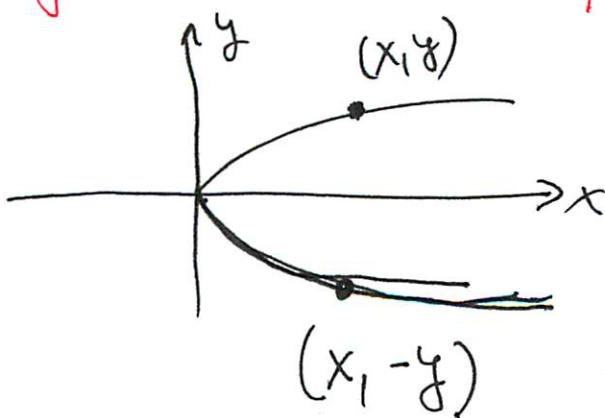
## VERTICAL LINE TEST



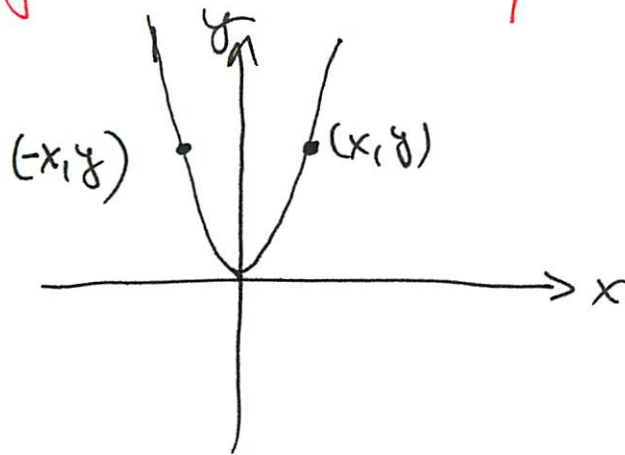
If a vertical line intersects the curve in at most one point then the curve is a function

## SYMMETRY

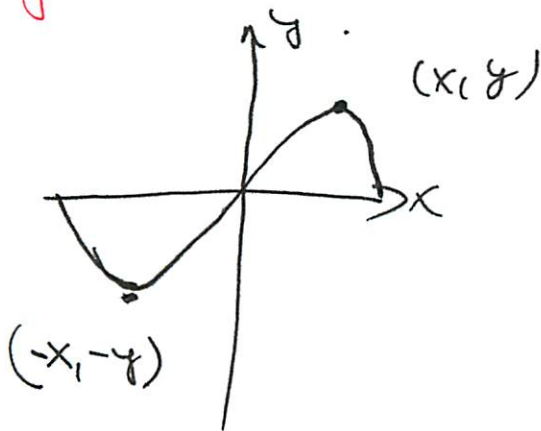
1. Symmetric with respect to the x-axis



2. Symmetric with respect to the  $y$ -axis



3. Symmetric with respect to the origin



Problem 10

a)  $f(0) = 0$        $x=0, y=0$   
 $f(6) = 0$        $x=6, y=0$

b)  $f(2) = -2$   
 $f(-2) = 1$

c)  $f(3) < 0$  Negative.

d)  $f(-1) > 0$  Positive.

e)  $f(x) = 0$        $y = 0$   
 $x = ?$        $x = 0, 4, 6$

f)  $f(x) < 0 \Rightarrow y < 0$   
 $(0, 4)$ ;  $0 < x < 4$

g) Domain  $[-4, 6]$   
 $\{x \mid -4 \leq x \leq 6\}$

h) Range.  $[-2, 3]$

$$\{y \mid -2 \leq y \leq 3\}$$

i) x-intercepts

$$(0, 0); (4, 0); (6, 0)$$

j) y-intercept

$$(0, 0)$$

k) 2 points

l) 1 point.

$$m) f(x) = 3 \Rightarrow y = 3 \Rightarrow x = 5$$

$$n) f(x) = -2 \Rightarrow y = 2 \Rightarrow x = 2.$$

### Problem 16

a) Domain  $[-2, 2]$   $\{x \mid -2 \leq x \leq 2\}$

Range.  $[-2, 2]$   $\{y \mid -2 \leq y \leq 2\}$

b) x-intercepts  $(-2, 0); (2, 0)$

y-intercepts  $(0, -2); (0, 2)$

c) symmetric with respect to x-axis  
y-axis  
origin.

x-intercept  $y=0$  ; solve the equation  $f(x)=0$   
y-intercept  $x=0$  ;  $f(0)$  - evaluate.

### Problem 28

$$f(x) = \frac{2x}{x-2}$$

a)  $\left(\frac{1}{2}, -\frac{2}{3}\right)$  on the graph?

$$f\left(\frac{1}{2}\right) = \frac{2 \cdot \frac{1}{2}}{\frac{1}{2} - 2} = \frac{1}{\frac{1}{2} - \frac{4}{2}} = \frac{1}{-\frac{3}{2}} = 1 \left(-\frac{2}{3}\right) = -\frac{2}{3}$$

yes;  $\left(\frac{1}{2}, -\frac{2}{3}\right)$  is on the graph.

b) if  $x=4$ ,  $f(x)=?$

$$f(4) = \frac{2 \cdot 4}{4-2} = \frac{8}{2} = 4 \quad (4, 4)$$

c)  $f(x)=1$  ( $y=1$ ) ;  $x=?$

$$\left. \begin{array}{l} f(x) = \frac{2x}{x-2} \\ f(x) = 1 \end{array} \right\} \Rightarrow \begin{array}{l} \frac{2x}{x-2} = 1 \quad | \cdot (x-2) \\ 2x = x-2 \\ -x \quad -x \\ \hline x = -2 \end{array} \quad (-2, 1)$$

d) Domain

$$x-2=0$$

$$x=2$$

$$\mathbb{R} - \{2\} \quad \text{or} \quad \{x \mid x \neq 2\}$$

e) x-intercept ·  $y=0$ ,  $f(x)=0$

$$\frac{2x}{x-2} = 0$$

$$2x=0$$

$$x=0$$

$$(0, 0)$$

f) y-intercept  $x=0$

$$f(0) = \frac{2 \cdot 0}{0-2} = \frac{0}{-2} = 0$$