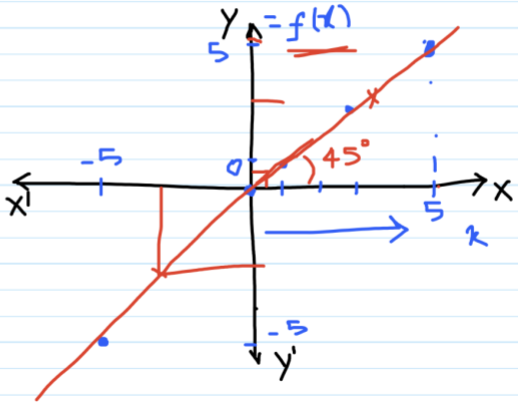
Function - Types

1. **Identity Functions:**

   $f: R \to R$, defined by:

   $f(x) = x$ for each $x \in R$.

x	y
0	0
1	1
5	5
-5	-5



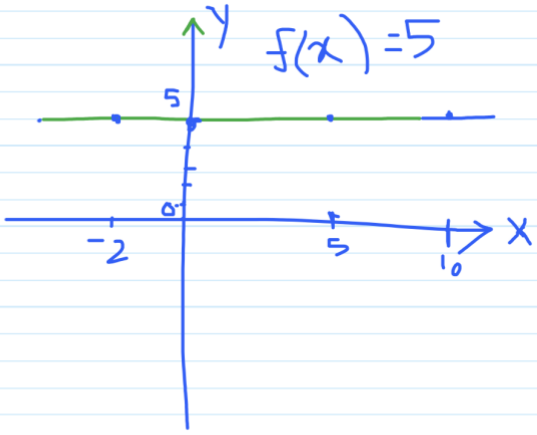
2. **Constant Function:**

   $f: R \to R$, defined as:

   $f(x) = c$, where c is a constant

$f(x) = 5$

x	y = f(x)
10	5
5	5
0	5
-2	5



3. **Polynomial Functions:**

   $f(x) = a_0 + a_1x + a_2x^2 + \ldots\ldots + a_nx^n$

   n = non-nengative integer

   a0, a1, a2,.... an $\in R$

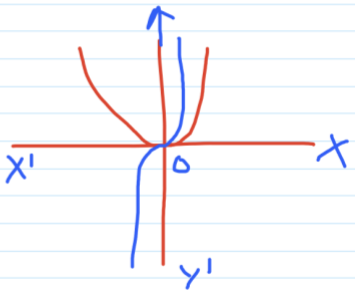
$n = 3$

$f(x) = 2x^3 + 1.x^2 - 5$

$5\sqrt{x}$ $5x^{1/2}$ ×

$2x^{3/2} + 5$ ×

$y = x^2$, $y = x^3$



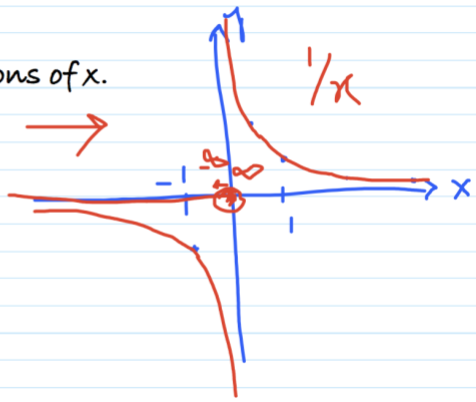
4. Rational Functions:

f(x)/g(x),

where f(x) and g(x) --- polynomial functions of x.

g(x) ≠ 0

$y = \frac{1}{x}, \quad x \in \mathbb{R} - \{0\}$



5. Modulus Function:

f : R->R, defined as

f(x) = |x|, x ∈ R

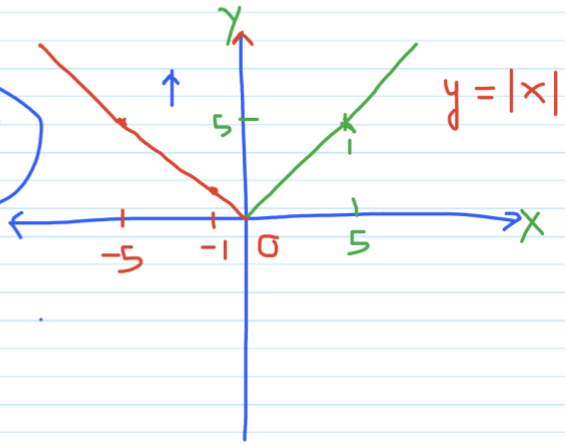
$$f(x) = \begin{cases} x & ; x >= 0 \\ -x & ; x < 0 \end{cases}$$

x	f(x)
2	2
1	1
0	0
-2	2
-5	5

+ve

D = R

R = R+



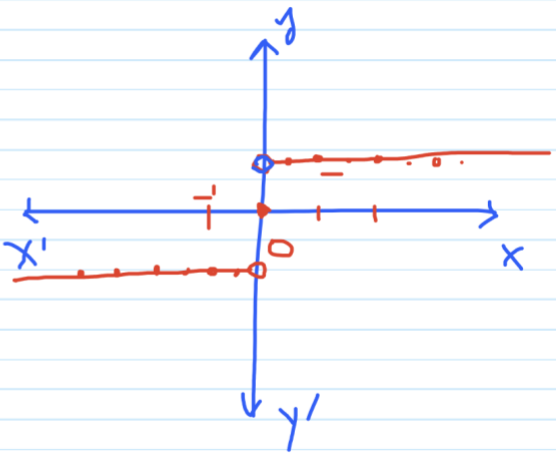
6. Signum Function:

$$f(x) = \begin{cases} 1 ; & x > 0 \\ 0 ; & x = 0 \\ -1 ; & x < 0 \end{cases}$$

$x \in \mathbb{R}$

Dom $= \mathbb{R}$

Range $= \{-1, 0, 1\}$



7. Greatest Integer Function:

$f(x) = [x]; x \in \mathbb{R}$

=> The value of the greatest integer <= x

x	f(x)
1.5	1
1.6	1
1.7	1
2	2
-1.5	-2
-1	-1
-2.5	-3
+2.5	2

(1) 0, -1, -2 - -

(2) 1, 0, Z⁻

(-2) -3, -4, . .

$[1, 2) \rightarrow 1$

$[2, 3) \rightarrow 2$