

** Property of Modulus function \Rightarrow

P-1: $|x| = a; a > 0 \Rightarrow x = \pm a$

$|x| = a; a = 0 \Rightarrow x = 0;$

$|x| = a; \underline{a \geq 0}$

P-2: CASE $\Rightarrow 1$ if $(a > 0)$

$|f(x)| < a$ and $a > 0 \Rightarrow -a < f(x) < a$

$|f(x)| > a$ and $a > 0 \Rightarrow -a < f(x) > a$

CASE $\Rightarrow 2$ if $(a < 0)$

$|f(x)| < a$ and $a < 0 \Rightarrow$ No solution ~~since $a > 0$~~

$|f(x)| > a$ and $a < 0 \Rightarrow$ valid for all real values of $f(x)$

P-3: if $x, y \in \mathbb{R}$

• $|-x| = |x|$

• $|x-y| = 0 \Leftrightarrow x=y$

• $|x+y| \leq |x| + |y|$

• $|x-y| \geq ||x| - |y||$

• $|xy| = |x||y|$

• $|x/y| = |x|/|y|$; $y \neq 0$