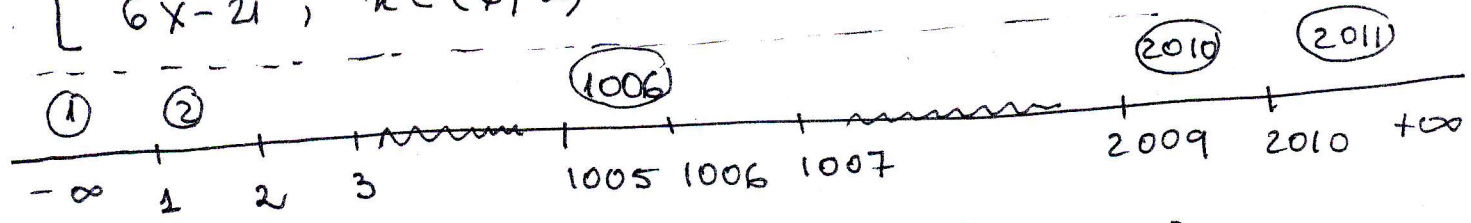


20)  $|x-1| + |x-2| + |x-3| + |x-4| =$

$$= \begin{cases} -4x+10, & x \leq 1 \\ -2x+8, & x \in (1, 2] \\ 4, & x \in [2, 3] \\ 2x-2, & x \in (3, 4] \\ 4x-10, & x \in (4, \infty) \end{cases} \Rightarrow |x-1| + |x-2| + |x-3| + |x-4| \geq 4 = 2^2 \text{ for all } x$$

$|x-1| + |x-2| + |x-3| + |x-4| + |x-5| + |x-6| =$

$$= \begin{cases} -6x+21, & x \leq 1 \\ -4x+19, & x \in (1, 2] \\ -2x+15, & x \in (2, 3] \\ 9, & x \in (3, 4] \\ 2x+1, & x \in (4, 5] \\ 4x-9, & x \in (5, 6] \\ 6x-21, & x \in (6, \infty) \end{cases} \Rightarrow |x-1| + |x-2| + \dots + |x-6| \geq 9 = 3^2 \text{ for all } x$$



middle interval  $\frac{1+2011}{2} = 1006 \Rightarrow x \in (1005, 1006]$

$x \in (1005, 1006]$

$$f(x) = |x-1| + |x-2| + \dots + |x-1005| + |x-1006| + \dots + |x-2010|$$

$$= (x-1) + (x-2) + \dots + (x-1005) + (-x+1006) + (-x+1007) + \dots + (-x+2010)$$

$$= 1005x - (1+2+\dots+1005) - 1005x + (1006+1007+\dots+2010) =$$

$$= \underbrace{(1005 + 1005 \dots + 1005)}_{1005 \text{ times}} = 1005^2 \Rightarrow f(x) \geq 1005^2 \text{ for all } x$$

$x \in [1006, 1007)$   $x \in [1005+i, 1005+2i)$

$$f(x) = 2xi + (1005)(1005-i) + \frac{(1006+i)(1005-i)}{2} - \frac{(1006+i)(1005+i)}{2}$$

$$= 2xi + (-i^2 - 2011i + 1005^2)$$

$f(1006) = 2 \cdot 1006 \cdot 1 - 1 - 2011 + 1005^2 \neq 1005^2$

ANSWER: E