

① Suppose $S \subset \mathbb{R}$ is nonempty

(a) Define " u is an upper bound of S ".

$u \in \mathbb{R}$ is ub for S if $u \geq a \ \forall a \in S$.

(b) If S has an upper bound, define $\hat{u} = \sup(S)$, the supremum of S .

\hat{u} is the supremum of S if \hat{u} is an ub for S

and if v is any ub for S then $\hat{u} \leq v$.

② Sketch the curve $y = |x-1| + |x-2|$ on the graph below.

$$x < 1 \Rightarrow y = -(x-1) - (x-2) \\ = -2x + 3$$

$$1 \leq x < 2 \Rightarrow y = (x-1) - (x-2) \\ = 1$$

$$2 \leq x \Rightarrow y = (x-1) + (x-2) \\ = 2x - 3$$

