

$$2) a) |f(x)| \leq |x|$$

$$\Rightarrow -x \leq f(x) \leq x$$

$$\Rightarrow -1 \leq f'(x) \leq 1$$

for all x .

$$b) \frac{f(b) - f(a)}{b - a} = f'(c), c \in [a, b]$$

by mean v

$$\frac{a - b}{b - a} = -1 = f'(c) \in [a, b]$$

c) Strictly decreasing

$$\Rightarrow a > b, f(b) < f(a)$$

$$\Rightarrow \frac{f(b) - f(a)}{b - a} < 0$$

$$\text{But } \frac{f(b) - f(a)}{b - a} = f'(x) < 0 \text{ for}$$

some $x \in [a, b] \therefore$ Satisfied