Show that for $0 < x < \frac{\pi}{2}$,

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$f(x) = \tan x$

$f'(x) = \sec^2 x$

$$\min_{0 \le x \le \frac{\pi}{2}} \sec^2 x \le \frac{f(b) - f(a)}{b - a} = f'(c) \le \max_{0 \le x \le \frac{\pi}{2}} \sec^2 x$$

$$\Rightarrow \quad 1 \le \frac{\tan(b) - \tan(a)}{b - a} \le \infty$$

$$\Rightarrow \quad \tan(b) - \tan(a) \ge b - a$$

Let $b \neq a$ and $a = 0$.

$$\Rightarrow \quad \tan b - 0 \ge b - 0$$

$$\tan b \ge b$$

Since $b \in (0, \frac{\pi}{2})$ and $b > 0$,

$\therefore \tan b > 0$

$\therefore \tan x > 0$ for $0 < x < \frac{\pi}{2}$.