Let $f \in C^1(a,b)$,
$\lim_{x\to a+} f(x) = +\infty$, $\lim_{x\to b-} f(x) = -\infty$
and $f'(x) + f^2(x) \geq -1$ for $x \in (a,b)$. Prove that
$b - a \geq \pi$ and give an example where $b - a = \pi$.