Consider the function $f(x) = x^3 - 2x^2 + 2x$.

(a) Find the local extrema of $f'(x)$. Are there any absolute extrema of f' on $(-\infty, \infty)$? Explain your findings.

(b) Prove that $f(x)$ is an increasing function. (How can your work in part (a) help you with your argument?)