The polynomial $ax^3 - 10x^2 + bx + 8$, where a and b are constants, is denoted by $\mathrm{p}(x)$. It is given that $(x - 2)$ is a factor of both $\mathrm{p}(x)$ and $\mathrm{p}'(x)$.

(a) Find the values of a and b. [5]

(b) When a and b have these values, factorise $p(x)$ completely. [3]