Problem statement Sketch the parabola $y = x^2$ and the line $y = 2x - 1$.

a) Show that $(1, 1)$ is the only point where the parabola and line intersect.

b) Show that any line other than $y = 2x - 1$ which contains $(1, 1)$ must intersect the parabola in some point besides $(1, 1)$.

Suggestion What condition guarantees that the line $y = mx + b$ contains the point $(1, 1)$? What condition guarantees that the quadratic equation $x^2 = mx + b$ has only one root?