a) $\frac{dy}{dx} = 3a(x-1)^2 + 2b(x-1) + c$

$\left.\frac{dy}{dx}\right|_{x=1} = 0$, so $c = 0$.

bi) $-a + b + 2 = 1$ | $ab = b$

$-a + \frac{b}{a} = -1$ | $b = \frac{b}{a}$

$-a^2 + a + b = 0$

$a = -2$, $b = -3$ or $a = 3$, $b = 2$

ii) $\frac{d^2y}{dx^2} = 6a(x-1) + 2b$

$\left.\frac{d^2y}{dx}\right|_{x=1} < 0$, $\therefore$ $\begin{cases} a = -2 \\ b = -3 \end{cases}$

thus the claim is disagreed.

$\frac{dy}{dx} = -6(x-1)^2 - 6(y-1)$

when $\frac{dy}{dx} = 0$, $(y-1)\left(-6(x-1) - 6\right) = 0$

$x = 1$ or $x = 0$