1 Network Calculus

Given a rate function $R$, functions $\alpha, \beta$ and the min-plus-convolution $\otimes$ from the lecture, prove the properties on slide 6/17:

a) If $R \leq R \otimes \alpha$ holds, $\alpha$ is an arrival curve.

b) If $R^* \geq R \otimes \beta$ holds, $\beta$ is a service curve.

2 FIFO Calculus

In the lecture, it was shown that FIFO is instable for $r > 0.85$ (slides 6/27ff). The proof ends on slide 6/34 with the statement that the node in the bottom left now holds $r^3s + r^2s/(r + 1) > s$ packets. Is the proof really complete now? Or do you still have to prove that a burst might happen as in the beginning? Justify your answer!

*Hint:* In case the lecture has not proceeded far enough, you might want to leave out this exercise.