More Queueing

1. Checkout lane. $\lambda = 0.25$ and $\mu = 1.0$, Find $N$ and $T$

   $N = \frac{1}{3}$
   $T = \frac{4}{3}$

2. On a network router, measurements show that
   a. packets arrive at a mean rate of 125 packets per second (pps) and
   b. the router takes about 2 milliseconds to forward them.

   Assuming an M/M/1 model,

   What is the probability of buffer overflow if the router had only 13 buffers?

   $3.73 \times 10^{-9} \sim 4$ times every billion packets

   How many buffers are needed to keep packet loss below one packet per million?

   10 buffers