1. (a) This is exactly the same Question as HW2. problem 2.

Except here the delay distribution is "given" as exponential ( ).

As we see in HW,

# of customers in the system is Poisson with parameter

$$\lambda \int_0^t 1 - G(t-s)\,ds = 3\int_0^{10} e^{-2(10-s)}\,ds = \frac{3}{2}\cdot[1 - e^{-20}]$$

$$\doteq 1.5$$

$[\ t=10,\quad \lambda = 3\ ,\quad 1-G(u) = e^{-2u}\ ]$ (This is also the Mean)

See also example in the book at p. 327. Example 5.18.

(b) This is another indep. spliting of the arrival process. Therefore the

# of Customer (female) in the system is Poisson with parameter

$$\lambda \int_0^{t=10} e^{-0.2s}\cdot[e^{-2(10-s)}]\,ds = 3\int_0^{10} e^{-0.2s}\, e^{-20}\, e^{2s}\,ds$$

$$= \frac{3}{1.8}\left(e^{-2} - e^{-20}\right) \approx 0.2255$$