4. Packets arrive at a network interface according to a Poisson stream with a rate of $\frac{1}{8}$ packets per time unit. Two types of packets can be distinguished: short packets, which are acknowledgements and they constitute 40% of the incoming packets, and long data packets. The time to transmit a short packet is exactly 1 time unit, to transmit a long one takes exactly 10 time units. Packets are transmitted in order of arrival.

   (a) What is the mean waiting time of an arbitrary packet?

   (b) Short packets are given priority over long data packets. Transmission of packets may not be interrupted. Determine the mean waiting time of a high-priority short packet and a low-priority long one.

5. Jobs arrive at a machine according to a Poisson process with a rate of 24 jobs per hour. The processsing time is uniform on $[1, 3]$ minutes. Jobs are processed in order of arrival.

   (a) Determine the mean flow time of an arbitrary job.

   (b) Small jobs (with a processing time less than 2 minutes) are processed with priority over big jobs (with a processing time greater than 2 minutes). Jobs in process at the machine can not be interrupted. Determine the mean flow time of a samll job, big job and an arbitrary job.