**STA 504 Homework #12**

**Due: Monday, December 02**

**Problem 1.**

The total time from arrival to completion of service at a fast-food outlet, , and the time spent waiting in line before arriving at the service window, , with joint density function

Another random variable of interest is , the time spent at the service window. Find the probability density function for .

**Problem 2.**

Let denote the volume of a three-dimensional figure. Let denote the number of particles

observed in volume and assume that has a Poisson distribution with mean . The particles

might represent pollution particles in air, bacteria in water, or stars in the heavens.If a point is chosen at random within the volume , then the distance to the nearest particle has the probability density function given by

Find the density function of has an exponential distribution.