



3. A company that manufactures 500 foot long wires knows that any particular 20 foot section of wire has on average one defect. Find the probability that a 60 foot section of wire has no defects. What is the probability that a 60 foot section has at most 2 defects? (You may use the table on the website to answer this question if you desire)
4. A newspaper stand orders only 3 copies of a certain newspaper because the manager knows that this particular paper is not purchased very often. If the number of purchases of this particular paper per day follows a Poisson distribution with  $\mu = 2$ , then how many of these newspapers does the stand sell on average in a day? How many papers should the manager buy so that the chance of someone not being able to purchase the paper on any given day is less than 5%?

5. Find  $c$  such that  $f(x) = cx^{-2}$ ,  $1 \leq x \leq \infty$  is a probability density function of a continuous random variable  $X$ . What is the expected value  $E(X)$ ?
6. Find  $d$  such that  $f(x) = dx^{-3}$ ,  $1 \leq x \leq \infty$  is a p.d.f. of a continuous random variable  $X$ . What is  $E(X)$ ? What is the variance  $Var(X)$ ?
7. The demand  $X$  for gas at a gas station has the p.d.f.  $f(x) = 4x^3e^{-x^4}$ ,  $0 < x < \infty$ , where  $x$  is in thousands of gallons. If the gas station manager only has 1000 gallons of gas at the beginning of the week, what is the probability that the station runs out of gas at some point during the week?