**Problem 1 – Section 4.9**

The distance between flaws on a long cable is exponentially distributed with a mean of 12 meters.

1. What is the probability that the distance between two consecutive flaws is greater than 15 meters?

Let Y = distance between flaws

= 0.2865

1. What is the probability that the distance between two consecutive flaws is between 8 and 20 meters?

= 0.3245

1. Suppose that there are no flaws in the first 5 meters inspected, what is the probability that there are no flaws in the next 10 meters inspected?

=0.4346

**Problem 2**

Basketball players arrive at a gym at an average rate of 1 every 4 minutes. A 3-on-3 pick-up game can start as soon as 6 players have arrived.

1. Suppose that the gym has just opened. What is the probability that the first player arrives within 3 minutes?

P(X<3 | λ = 1/4) == 0.5276

1. On average how long does it take to start a game? [Erlang]

λ = ¼; r = 6

E(X) = = 24 minutes

1. What is the probability that it takes more than 30 minutes to start a game?

Let Y = number of people in 30 minutes

P(Y<6 | λ = ¼ and x=30) = = P(Y=0) + … + P(Y=5)

= = 

= **…+**

= 0.24

**Problem 3**

The lifetime of a cooling fan, in hours, that is used in a computer system has a Weibull distribution with parameters β = 2/3 and δ = 10,000 hours.

1. What is the probability that fan lasts more than 10,000 hours?

P(X>10000) = == 0.3679

1. Determine the mean life of the pump.

= 10000\*(3/2)! = 13293hrs