Worksheet E: Calculating probabilities exam style

1. The number of customers arriving at a supermarket checkout can be modelled as a Poisson distribution with mean 2.3 per 10-minute interval. Find the probability that:
   1. No customers arrive between 0950 and 1000.
   2. 3 customers arrive between 1400 and 1420.
   3. 1 customer arrives between 1830 and 1835.
2. An insurance company helpline receives on average 3 calls every 5 minutes, assuming the calls follow a Poisson distribution. Find the probability that:
3. they will receive fewer than 5 calls in a 10-minute period
4. they will receive exactly 9 calls in a 30-minute period
5. they will receive more than 3 but fewer than 6 calls in a 15 minute period.

Worksheet E: Calculating probabilities exam style   
continued

1. Faults in a certain piece of fabric occur at random and independently. On average the faults occur at a rate of 2 per metre. Find the probability that:
2. more than 3 faults will occur in a piece of fabric 2 metres long
3. between 2 and 5 faults inclusive will occur in a piece of fabric 150 cm long.

**Extension question**

Given that the probability of receiving 4 calls in 10 minutes is twice as likely as receiving 5 calls in 10 minutes, find the average number of calls received per hour.