General Question types

- Simple Question with just formula:

1. The number of accidents which occur on a particular stretch of road in a day may be modelled by a Poisson distribution with parameter 1.3. Find the expectance and variance of the distribution. Find the probability that on a particular day: a. exactly 2 accidents occur on that stretch of road. b. fewer than two accidents occur c. More than 3 accidents occur

> Hint: X ~ Po(1.3)

- Question with parameter change:

2. The number of people calling a car breakdown service can be modelled by a Poisson distribution, and the service has an average of 6 calls per hour. Find the probability that in a half-hour period: a. exactly 2 calls are received b. more than 2 calls are received

> Hint: change the parameter

- Recurrence relation and mode:

3. X ~ Po(λ) and P(X=4) = 1.2*P(X=3). a. Find the value of lambda b. Find the mode of X c. What would the mode be if λ were 0.5 and if λ = 4.5

> If λ < 1, mode is 0. Mode is floor of λ if lambda is not integer. If it is integer, mode is λ and λ-1.

- Poisson Approximation to binomial distribution:

4. A rare medical condition affects 1 in 150 sheep. a. In a small farm holding with a flock of 180 sheep, what is the probability that exactly one sheep has the condition? b. A large farm has a flock of 500 sheep. Use an appropriate approximate distribution to find the probability that there are 5 fewer than 5 sheeps with the condition.

> You can use the approximation if n > 50 and np < 5. λ = np

- Normal approximation to Poisson distribution:

5. The number of letters delivered to a house on a day may be modelled by a Poisson distribution with parameter 1.5. a. Find the probability that there are 2 letters delivered on a particular day. b. The home owner is away for 3 weeks. Find the probability that there will be more than 25 letters waiting for him when he gets back.

> Always remember continuity correction.

Now do summary exercise from Nelson Stat