

E.g. 3 A shop sells a particular make of radio at a rate of 4 per week on average. The number sold in a week has a Poisson distribution.

- (a) Find the probability that the shop sells at least 2 in a week.
- (b) Find the smallest number that can be in stock at the beginning of the week in order to have at least a 99 % chance of being able to meet all demands during that week.

Give your answers to 4 s.f.

[Video: Finding an observed value](#)

[Video: Poisson distribution EQ](#)

[Solutions to Starter and E.g.s](#)

Exercise

p41 3A 3, 4-6, 9-12, (7-8 A2, 13-15 red)

Summary

$$P(X = x) = \frac{e^{-\lambda} \lambda^x}{x!} \text{ for } x = 0, 1, 2, 3, 4, \dots$$

If $X \sim \text{Po}(\lambda)$ then

Mean: $\mu = E(X) = \lambda$

Variance: $\sigma^2 = \text{Var}(X) = \lambda$

Standard deviation: $\sigma = \sqrt{\lambda}$

If the length or period of time is increased, increase the value of λ by the proportional amount.