Poisson vs Binomial

*Avg rates of success
*Events occur at a constant rate

*Individual Trials
*Fixed number of trials

Recordable accidents at a factory average 7 per year, independently of one another. Find the probability that 3 accidents occur in a given year.

$$P = \frac{e^{-m} m^{x}}{x!}$$

m = mean

$\lambda = m$

$$P = \frac{e^{-7} \cdot 7^{3}}{3 \cdot 2 \cdot 1}$$

$= 5.21\%$

A light bulb manufacturer shows an average of 1.8 flaws per production run.

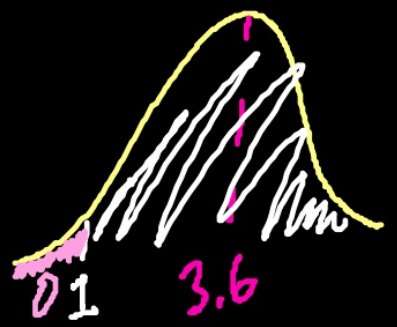
a) Determine the probability that there is exactly 1 flaw in 1 production run.

$$P = \frac{e^{-1.8}(1.8)^1}{1!} = 29.8\%$$

b) Find the probability that there is at least 1 flaw in 2 production runs. = 97.3%

$m = 3.6$

$x = 1$



Shooting stars on the Perseid event occur on average one every 5 seconds. What is the probability that more than 20 are seen in a minute?

$\lambda = 12$

$x = 20$

$P = 98.8\%$

1.16%