

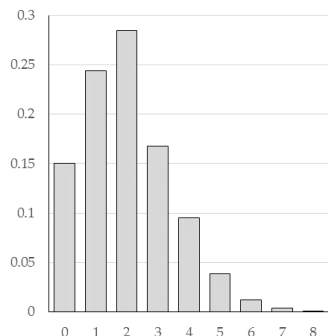
### Part 9.1: Calculate the Mean for a Poisson Distribution

The only other thing that you may need to do is calculate the mean. If we use the example on the right which is a binomial distribution, the number of trials is 4, and to work out the mean we can use it like a discrete variable.

$$\mu = 0 \times 0.25 + 1 \times 0.35 + 2 \times 0.25 + 3 \times 0.1 + 4 \times 0.05 = 1.35$$

For the binomial distribution we also know that  $\mu = n\pi$ .

If  $n = 4$  and  $\mu = 1.35$  so to work out  $\pi$  we get  $\pi = 1.35 \div 4 = 0.3375$



The other thing we sometimes might need to do is work out the mean for a Poisson distribution.

To do this, because the Poisson keeps going on

forever we need to use the formula  $P(X = 0) = \frac{\lambda^0 e^{-\lambda}}{0!} = e^{-\lambda} = 0.15$ .

If we solve  $e^{-\lambda} = 0.15$  either using either algebra or equation mode on the calculator we get  $\lambda = 1.897$  (4sf)

