Expected # of Islands

$\lambda := N/g$ = probability a read starts at a given position (assuming random sampling)

Pr(*k* reads start in an interval of length *x*)

x trials, want *k* "successes," small probability λ of success

Expected # of successes = λx

Poisson approximation to binomial distribution:

$$\Pr(k \text{ reads in length } x) = e^{-\lambda x}\frac{(\lambda x)^k}{k!}$$

Expected # of islands = $N \times$ Pr(read is at rightmost end of island)

$= N \times \Pr(\text{0 reads start in } (1-\theta)L)$

$= Ne^{-\lambda(1-\theta)L}\frac{\lambda^0}{0!}$ (from above)

$= Ne^{-\lambda(1-\theta)L}$

$= Ne^{-(1-\theta)LN/g}$ ← LN/g is called the **coverage** *c*.