HW7 solution

5.49

Using the negative binomial distribution, the required probability is

$$\mathrm{b}^*(10;5,0.3) = \mathrm{C}_4^9(0.3)^5(0.7)^5 = 0.0515$$

5.55

Using the geometric distribution

a. $\mathrm{P}(\mathrm{X}=3) = \mathrm{g}(3;0.7) = (0.7)(0.3)^2 = 0.0630$

b. $\mathrm{P}(\mathrm{X}<4) = \sum_{x=1}^{3} \mathrm{g}(\mathrm{x};0.7) = \sum_{x=1}^{3}(0.7)(0.3)^{x-1} = 0.9730$

5.65 (Matlab)

a. $\mathrm{P}(\mathrm{X} \le 3|\lambda \mathrm{t}=5) = 0.2650$

b. $\mathrm{P}(\mathrm{X}>1|\lambda t=5) = 1-0.0404 = 0.9560$

Code:

a. $\mathrm{poisscdf}(3,5) = 0.2650$

b. $1-\mathrm{poisscdf}(1,5) = 1-0.0404 = 0.9560$