

Fasit til ukeoppgaver med gjennomgang 8. mars

Ekstraoppgave 3a

$$\begin{aligned} E[Y|X = x] &= xp \\ \text{Var}[Y|X = x] &= xp(1 - p) \\ E[Y] &= \lambda p \\ \text{Var}[Y] &= \lambda p \end{aligned}$$

Ekstraoppgave 11

a)

$$\begin{aligned} p = 0 : & \begin{cases} q = 0 : & \{1, 2, 3, 4\}: \text{Rekurrent} \\ q = 1 : & \{1\} \text{ og } \{2\}: \text{Transiente. } \{3, 4\}: \text{Rekurrent} \\ 0 < q < 1 : & \{1, 2, 3, 4\}: \text{Rekurrent} \end{cases} \\ p = 1 : & \begin{cases} q = 0 : & \{1, 2\}: \text{Rekurrent. } \{3\} \text{ og } \{4\}: \text{Transiente} \\ q = 1 : & \{1, 2\} \text{ og } \{3, 4\}: \text{Rekurrente} \\ 0 < q < 1 : & \{1, 2\}: \text{Rekurrent. } \{3, 4\}: \text{Transient} \end{cases} \\ 0 < p < 1 : & \begin{cases} q = 0 : & \{1, 2, 3, 4\}: \text{Rekurrent} \\ q = 1 : & \{1, 2\}: \text{Transient. } \{3, 4\}: \text{Rekurrent} \\ 0 < q < 1 : & \{1, 2, 3, 4\}: \text{Rekurrent} \end{cases} \end{aligned}$$

d)

$$\begin{aligned} \pi_1 &= \frac{1}{6} \\ \pi_2 &= \frac{1}{3} \\ \pi_3 &= \frac{1}{3} \\ \pi_4 &= \frac{1}{6} \end{aligned}$$

f)

$$\begin{aligned} \pi_0 &= \frac{1}{3} \\ \pi_1 &= \frac{2}{3} \end{aligned}$$

i)

$$\lim_{n \rightarrow \infty} q_{01}^{(n)} = \frac{1}{3} = \pi_0$$