4.1.5

naboer til X: B, C, Y, Z : $\quad x = \frac{1}{4}(b+c+y+z)$

naboer til Y: A, C, X, Z : $\quad y = \frac{1}{4}(a+c+x+z)$

naboer til Z : A, B, X, Y : $\quad z = \frac{1}{4}(a+b+x+y)$

$$\Rightarrow \begin{aligned} 4x &= b+c+y+z \\ 4y &= a+c+x+z \\ 4z &= a+b+x+y \end{aligned} \Longleftrightarrow \begin{aligned} -4x+y+z &= -b-c \\ x-4y+z &= -a-c \\ x+y-4z &= -a-b \end{aligned}$$

$$\begin{aligned} x-4y+z &= -a-c \\ -4x+y+z &= -b-c \\ x+y-4z &= -a-b \end{aligned} \left.\begin{aligned} \\ \cdot 4 \\ \\ \end{aligned}\right\}_1 \Longleftrightarrow \begin{aligned} x-4y+z &= -a \quad -c \\ -15y+5z &= -4a-b-5c \\ 5y-5z &= \quad -b+c \end{aligned} \Big\}_3$$

$$\begin{aligned} x-4y+z &= -a \quad -c \\ 5y-5z &= \quad -b+c \\ -10z &= -4a-4b-2c \Rightarrow z = \frac{1}{5}(2a+2b+c) \end{aligned}$$

$$\Rightarrow y = z + \frac{1}{5}(-b+c) \Rightarrow \frac{1}{5}(2a+2b+c-b+c) = \frac{1}{5}(2a+b+2c)$$

$$x = 4y - z - a - c = \frac{4}{5}(2a+b+2c) - \frac{1}{5}(2a+2b+c) - \frac{1}{5}(5a+5c)$$

$$= \frac{1}{5}(a+2b+2c)$$

4.1.6 x = sannsynlighet for at A vinner fra like
        y = _____ " ————— fra fordel A
        z = _____ " ————— fra fordel B

$x = 0.6y + 0.4z$
$y = 0.4x + 0.6$
$z = 0.6x$

$0.4 \begin{cases} x = \quad\quad 0.6y + 0.4z \\ y = \quad 0.4x \quad\quad\quad +0.6 \\ z = \quad 0.6x \end{cases}$

$0.76x = 0.6y$
$\quad y = 0.4x + 0.6 \Big\} 0.6 \Rightarrow$
$\quad z = 0.6x$

$0.52x = \quad\quad 0.36$
$\quad y = 0.4x \quad +0.6$
$\quad z = 0.6x$

første: $x = \dfrac{36}{52} = \dfrac{9}{13}$

andre: $y = \dfrac{18}{65} + 0.6 = \underline{\dfrac{57}{65}}$

tredje: $z = \underline{\dfrac{27}{65}}$

4.2.10

$$a + b + c = 120$$
$$0.6a + 0.3b + 0.6c = a \quad \text{retur til by A}$$
$$0.3a + 0.5b + 0.1c = b \quad \text{retur til by B}$$
$$0.1a + 0.2b + 0.3c = c \quad \text{retur til by C}$$

$$a + b + c = 120$$
$$-0.4a + 0.3b + 0.6c = 0$$
$$0.3a - 0.5b + 0.1c = 0$$
$$0.1a + 0.2b - 0.7c = 0$$

$\longrightarrow$

$$\begin{pmatrix} 1 & 1 & 1 & 120 \\ -0.4 & 0.3 & 0.6 & 0 \\ 0.3 & -0.5 & 0.1 & 0 \\ 0.1 & 0.2 & -0.7 & 0 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 1 & 1 & 120 \\ -4 & 3 & 6 & 0 \\ 3 & -5 & 1 & 0 \\ 1 & 2 & -7 & 0 \end{pmatrix} \begin{matrix} II+4I \\ III-3I \\ \widetilde{} \\ IV-I \end{matrix} \begin{pmatrix} 1 & 1 & 1 & 120 \\ 0 & 7 & 10 & 480 \\ 0 & -8 & -2 & -360 \\ 0 & 1 & -8 & -120 \end{pmatrix}$$

$$\sim \begin{pmatrix} 1 & 1 & 1 & 120 \\ 0 & 1 & -8 & -120 \\ 0 & -8 & -2 & -360 \\ 0 & 7 & 10 & 480 \end{pmatrix} \begin{matrix} III+8II \\ \\ \end{matrix} \sim \begin{pmatrix} 1 & 1 & 1 & 120 \\ 0 & 1 & -8 & -120 \\ 0 & 0 & -66 & -1320 \\ 0 & 0 & 66 & 1320 \end{pmatrix} \sim \begin{pmatrix} 1 & 1 & 1 & 120 \\ 0 & 1 & -8 & -120 \\ 0 & 0 & 1 & 20 \\ 0 & 0 & 0 & 0 \end{pmatrix}$$

$\rightarrow$ likning 3: $c = 20$

likning 2: $b = 8c - 120 = 160 - 120 = 40$

likning 1: $a = -b - c + 120 = -40 - 20 + 120 = 60$

$a = 60, \quad b = 40, \quad c = 20$

A.7.S t_i: Forventede antall kast vi trenger for å komme i mål.

$$t_1 = \frac{1}{6}(1+t_2) + \frac{1}{6}(1+t_3) + \frac{1}{6}(1+t_4) + \frac{1}{6}(1+t_5) + \frac{1}{6}(1+t_6) \\ + \frac{1}{6}(1+t_7)$$

$$= \frac{1}{6}t_2 + \frac{1}{6}t_3 + \frac{1}{6}t_4 + \frac{1}{6}t_5 + \frac{1}{6}t_6 + \frac{1}{6}t_7 + \underbrace{\frac{1}{6}+\frac{1}{6}+\frac{1}{6}+\frac{1}{6}+\frac{1}{6}+1}_{1}$$

$$G'(x,y) = \begin{pmatrix} -\sin(x-y) & \sin(x-y) \\ \cos(x+y) & \cos(x+y) \end{pmatrix}$$

$$G'\left(\tfrac{\pi}{2},0\right) = \begin{pmatrix} -1 & 1 \\ 0 & 0 \end{pmatrix}$$

$$f'(\vec{G}(x))\,\vec{G}'(x) = (2,3) \begin{pmatrix} -1 & 1 \\ 0 & 0 \end{pmatrix} = \begin{pmatrix} -2 & 2 \end{pmatrix}$$