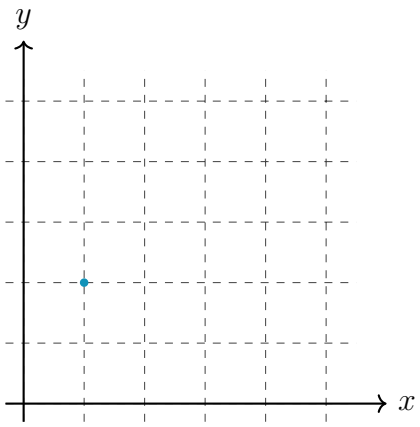
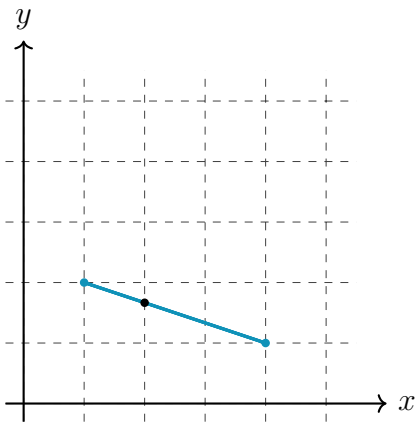
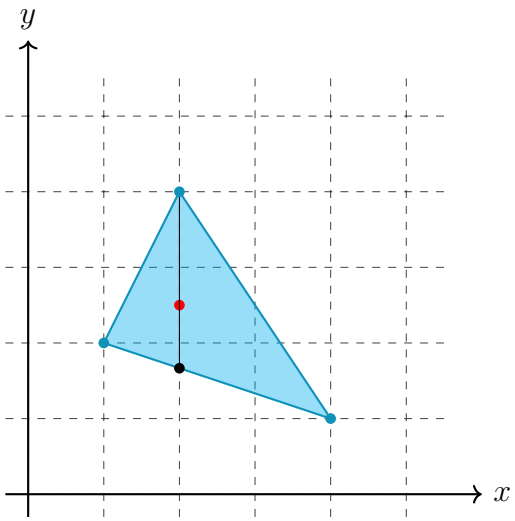


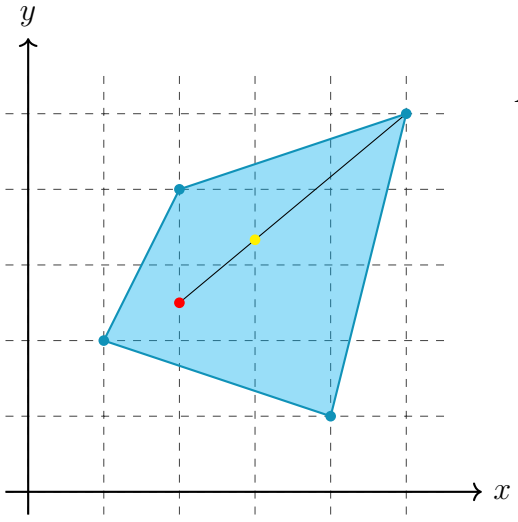
$$A_1 = \left\{ \begin{pmatrix} 1 \\ 2 \end{pmatrix} \right\}$$



$$\begin{aligned} A_2 &= \left\{ \begin{pmatrix} 1 \\ 2 \end{pmatrix} + \lambda \underbrace{\begin{pmatrix} 3 \\ -1 \end{pmatrix}}_{=\binom{4}{1}-\binom{1}{2}} \mid \lambda \in [0,1] \right\} \\ &= \left\{ (1-\lambda) \begin{pmatrix} 1 \\ 2 \end{pmatrix} + \lambda \begin{pmatrix} 4 \\ 1 \end{pmatrix} \mid \lambda \in [0,1] \right\} \\ &= \left\{ a \begin{pmatrix} 1 \\ 2 \end{pmatrix} + b \begin{pmatrix} 4 \\ 1 \end{pmatrix} \mid a, b \in [0,1],\ a+b=1 \right\} \end{aligned}$$



$$\begin{aligned} A_3 &= \left\{ c\,\boldsymbol{x} + d \begin{pmatrix} 2 \\ 4 \end{pmatrix} \mid \boldsymbol{x} \in A_2,\ c, d \in [0,1],\ c+d=1 \right\} \\ &= \left\{ ca \begin{pmatrix} 1 \\ 2 \end{pmatrix} + cb \begin{pmatrix} 4 \\ 1 \end{pmatrix} + d \begin{pmatrix} 2 \\ 4 \end{pmatrix} \mid \dots \right\} \\ &= \left\{ c_1 \begin{pmatrix} 1 \\ 2 \end{pmatrix} + c_2 \begin{pmatrix} 4 \\ 1 \end{pmatrix} + c_3 \begin{pmatrix} 2 \\ 4 \end{pmatrix} \;\middle|\; \begin{matrix} c_1, c_2, c_3 \in [0,1] \\ c_1 + c_2 + c_3 = 1 \end{matrix} \right\} \end{aligned}$$



$$\begin{aligned} A &= \left\{ c\,\boldsymbol{x} + d \begin{pmatrix} 5 \\ 5 \end{pmatrix} \mid \boldsymbol{x} \in A_3,\ c, d \in [0,1],\ c+d=1 \right\} \\ &= \left\{ c_1 \begin{pmatrix} 1 \\ 2 \end{pmatrix} + c_2 \begin{pmatrix} 4 \\ 1 \end{pmatrix} + c_3 \begin{pmatrix} 2 \\ 4 \end{pmatrix} + c_4 \begin{pmatrix} 5 \\ 5 \end{pmatrix} \;\middle|\; \begin{matrix} c_i \in [0,1] \\ \sum_i c_i = 1 \end{matrix} \right\} \end{aligned}$$