Exercise 40

a)

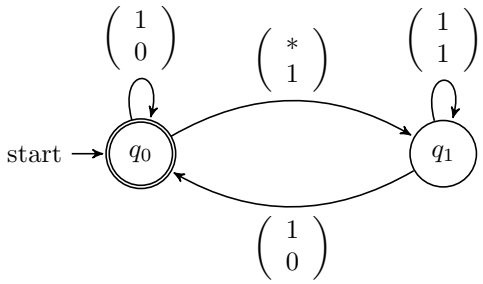
$$\varphi_a = \mathbf{FG}((\neg p_1 \wedge \neg p_2) \vee (p_1 \wedge \neg p_2))$$

b)

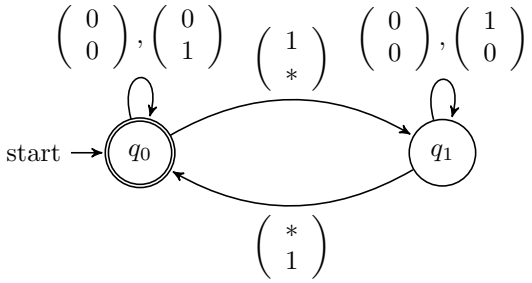
$$\varphi_b \quad = \quad \mathbf{FG}(\mathbf{F}(\neg p_1 \wedge p_2) \wedge \mathbf{F}(p_1 \wedge \neg p_2) \wedge \neg \mathbf{F}(p_1 \wedge p_2))$$

Exercise 41

a)



b)



42

a)

$$\alpha_a = \left(\begin{pmatrix} 1 \\ * \end{pmatrix} \begin{pmatrix} 0 \\ * \end{pmatrix} \right)^{\omega}$$

$$\alpha_a \models \varphi_2 \text{ and } \alpha_a \not\models \varphi_1$$

b)

$$\alpha_b = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}^{\omega}$$

$$\alpha \models \psi_1 \text{ and } \alpha \not\models \psi_2$$

43

a)

$$\varphi_a = p_1 \wedge \mathbf{X}\neg p_1 \wedge \mathbf{G}(\mathbf{XXX}\neg p_1 \wedge \mathbf{XXXX}p_1 \wedge \mathbf{XXXXX}p_1 \wedge p_1 \rightarrow \mathbf{XXX}p_1)$$

$\alpha \models \varphi_a$. The first two letters of α must be an 10 which is given by $p_1 \wedge \mathbf{X}\neg p_1$ so *alpha* must have a form like $\alpha = 10 \cdot w$. The second part of the formula $\mathbf{G}\varphi$

b)