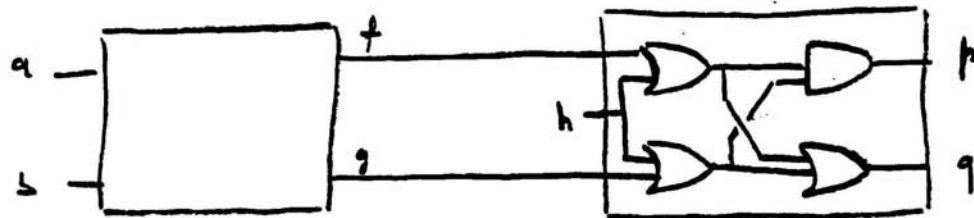


- 3) The circuit in the box is driving another circuit as shown below.
What are the possible output patterns in terms of variables (p,q)?



$$p = (f+h)(g+h) = fg + h$$

$$q = (f+h) + (g+h) = f + g + h$$

$$\text{Since } f + g = 1 \Rightarrow q = 1$$

p can be 1, 0

Output vectors are $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$ $\begin{bmatrix} 0 \\ 1 \end{bmatrix}$

- 4) Assume that f and g can take any value,
what are the possible output vectors?

vector $\begin{bmatrix} 0 \\ 0 \end{bmatrix}$ is possible when all inputs are 0

vector $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$ is NOT possible because

$$fg + h = 1 \Rightarrow f + g + h = 1$$