

[1]

$$\begin{aligned}
 \text{cov}_{xy} &:= E[(x - E[x])(y - E[y])] = \\
 &= E[xy - xE[y] - yE[x] + E[x]E[y]] = \\
 &= E[xy - xE[y] - yE[x] + E[x]E[y]] = \\
 &= E[xy] - E[xE[y]] - E[yE[x]] + E[E[x]E[y]] = \\
 &= E[xy] - E[x]E[y] - E[y]E[x] + E[x]E[y] = \\
 &= E[xy] - E[x]E[y]
 \end{aligned}$$

$$\begin{aligned}
 \text{cov}_{xy} &:= E[(x - E[x])(y - E[y])] = \\
 &= E[xy] - E[x]E[y]
 \end{aligned}$$

[2]

D-ans:  
 $x, y$  - независимы  $\Rightarrow \text{cov}_{xy} = 0$

D-vo:

$$\begin{aligned}
 \text{cov}_{xy} &:= E[(x - E[x])(y - E[y])] = \\
 &= (x, y \text{ - независимы}) = E[x - E[x]] E[y - E[y]] = \\
 &= (E[x] - E[E[x]])(E[y] - E[E[y]]) = \\
 &= (E[x] - E[x])(E[y] - E[y]) = 0 \cdot 0 = 0 \quad \square
 \end{aligned}$$

$$\begin{aligned}
 \text{cov}_{xy} &= E[xy] - E[x]E[y] = \\
 &= (x, y \text{ - независимы}) = E[x]E[y] - E[x]E[y] = 0 \quad \square
 \end{aligned}$$

$$x, y \text{ - независимы} \Rightarrow \text{cov}_{xy} = 0$$