(Q9)
False. Consider the matrices

$$\begin{pmatrix} 2 & 5 & 1 \\ 0 & 3 & 4 \\ 0 & 0 & 1 \end{pmatrix} \qquad \begin{pmatrix} 2 & 4 & 2 \\ 0 & 3 & 3 \\ 0 & 0 & 1 \end{pmatrix}$$

From these two matrices we obtain:

$$AB = \begin{pmatrix} 4 & 23 & 20 \\ 0 & 9 & 13 \\ 0 & 0 & 1 \end{pmatrix} \quad BA = \begin{pmatrix} 4 & 22 & 20 \\ 0 & 9 & 15 \\ 0 & 0 & 1 \end{pmatrix}$$

AB and BA have the same eigenvalues but are clearly not equal.