A8(c)

We start with the following property of an invertible matrix:

$$BB^{-1} = I,$$

where I is the identity matrix.

Taking the transpose of both sides:

$$(BB^{-1})^\top = I^\top.$$

Using the property of transposes for matrix multiplication, $(AB)^\top = B^\top A^\top$, this becomes:

$$(B^{-1})^\top B^\top = I^\top.$$

Since the transpose of the identity matrix is itself ($I^\top = I$), we have:

$$(B^{-1})^\top B^\top = I.$$

Because B is symmetric, $B^\top = B$, so:

$$(B^{-1})^\top B = I.$$

By the definition of the inverse, this implies:

$$(B^{-1})^\top = B^{-1}.$$

Thus, B^{-1} is symmetric.

$\blacksquare$