Complex conjugate matrices

Given and $m \times n$ matrix $A = (a_{i,j})$ over the complex numbers, its **conjugate matrix** is given by

$$\overline{A} \;=\; (\,\overline{a_{i,j}}\,)$$

where $\overline{z}$ is the complex conjugate of z. Since complex conjugation sends sums to sums and products to products, it is a routine exercise to verify the following identities:

$$\overline{A+B} \;=\; \overline{A} + \overline{B}$$

$$\overline{cA} \;=\; \overline{c} \cdot \overline{A}$$

$$\overline{AB} \;=\; \overline{A} \cdot \overline{B}$$

These identities yield the proposition on page 3 of `math132notes5B.pdf`.