

Question 4.

Let A and B be $n \times n$ real matrices. If $AB = A + B$, show that $AB = BA$.

(10 Marks)

Solution

$AB = A + B$
$AB - A - B + I_n = I_n$
$(A - I_n)(B - I_n) = I_n$
Since $(A - I_n)(B - I_n) = I_n$ implies $(B - I_n)(A - I_n) = I_n$
$BA - B - A + I_n = I_n$
$BA = A + B = AB$