

a) i) $A = \begin{pmatrix} 8 & -1 & 7 \\ -5 & 2 & 5 \\ 3 & 0 & 2 \end{pmatrix}$ $B = \begin{pmatrix} -2 & 8 & 0.5 \\ 2 & 5 & 2 \\ 0 & -9 & 1 \end{pmatrix}$

3×3 3×3 can multiply

$AB = \begin{pmatrix} -16 + -2 + 0 & 64 + -5 + -6.3 & 4 + -2 + 7 \\ -10 + 4 + 0 & -40 + 10 + -4.5 & -2.5 + 4 + 5 \\ -6 + 0 + 1 & 24 + 0 + -18 & 1.5 + 0 + 2 \end{pmatrix}$

$AB = \begin{pmatrix} -18 & -4 & 9 \\ -6 & -7.5 & 6.5 \\ -5 & 6 & 3.5 \end{pmatrix}$

ii) $B = \begin{pmatrix} -2 & 8 & 0.5 \\ 2 & 5 & 2 \\ 0 & -9 & 1 \end{pmatrix}$ $A = \begin{pmatrix} 8 & -1 & 7 \\ -5 & 2 & 5 \\ 3 & 0 & 2 \end{pmatrix}$

3×3 3×3

$BA = \begin{pmatrix} -16 + 40 + 1.5 & 2 + 16 + 0 & -14 + 40 + 1 \\ 16 + -25 + 6 & -2 + 10 + 0 & 14 + 25 + 4 \\ 0 + 45 + 3 & 0 + -18 + 0 & 0 + -45 + 2 \end{pmatrix}$

$BA = \begin{pmatrix} 54.5 & 18 & 26 \\ -3 & 8 & 43 \\ 48 & -18 & -43 \end{pmatrix}$

$AB \neq BA$ matrices are non commutative (matrices)