

$$1) \begin{pmatrix} 3 & -3 \\ 2 & 0 \\ 1 & 4 \end{pmatrix} \begin{pmatrix} 2 & -1 & 5 \\ 0 & 3 & -2 \end{pmatrix} = \begin{pmatrix} 9 & 4 \\ -8 & -2 \end{pmatrix}$$

$$3 \times 2 + 2 \times -1 + 1 \times 5 = 9$$

$$3 \times 0 + 0 \times 3 + 4 \times -2 = -8$$

$$-3 \times 2 + 0 \times -1 + 4 \times 5 = 4$$

$$3 \times 0 + 2 \times 3 + 1 \times -2 = -2$$

To do this, you do the first column times the in the first brackets so numbers 3, 2 and 1 and the top column in the second brackets so numbers 2, -1 and 5. Then you do the first row numbers in the from both set of numbers and multiply them then you add the next numbers from the first and multiply them then you repeat for the third set so it would be $3 \times 2 + 2 \times -1 + 1 \times 5 = 9$ and continue doing this until you have done all the sets of numbers by the other 2 sets in the other brackets. Forget the positioning of the number it would be where the two columns are so 3, 2, 1 are on the left and 2, -1, 5 are on the top so 9 would be in the top left.

$$2) \begin{pmatrix} 2 & -1 \\ 3 & 5 \end{pmatrix} \begin{pmatrix} 5 & -3 \\ -1 & 0 \end{pmatrix} = \begin{pmatrix} 1 & -20 \\ -2 & -1 \end{pmatrix}$$

$$2 \times 5 + 3 \times -3 = 1$$

$$-1 \times 5 + 5 \times -3 = -20$$

$$2 \times -1 + 3 \times 0 = -2$$

$$-1 \times -1 + 5 \times 0 = -1$$

This one is very similar to the first one just be careful to check which brackets goes length ways and which goes high ways because if you do the wrong one then you will get the wrong answer.

3) $p = \begin{pmatrix} 2 & 3 \\ 1 \end{pmatrix}$ $q = \begin{pmatrix} 1 \\ 0 \\ 5 \end{pmatrix}$ so in this $pq = qp$ because when you do this you would do each column so there is one column and in this there is one column in each brackets so if you invert it it would stay the same

~~4) $A = \begin{pmatrix} 1 & 0 \\ 3 & 1 \end{pmatrix}$ $B = \begin{pmatrix} 3 & 2 \\ 0 & 1 \end{pmatrix}$ in this case $AB = BA$~~