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| **Literacy**Matrix, dimension, symmetric, non-commutative, nilpotent | **Research**Research the Jacobi method for solving linear systems. Show 2 steps of this method for the linear system $\left(\begin{matrix}2&1\\1&3\end{matrix}\right)\left(\begin{matrix}x\\y\end{matrix}\right)= \left(\begin{matrix}7\\10\end{matrix}\right)$ | **Memory**For matrices $A, B$ $AB\ne BA$$$\left(\begin{matrix}a&b\\c&d\end{matrix}\right)\left(\begin{matrix}e&f\\g&h\end{matrix}\right)= \left(\begin{matrix}ae+bg&af+bh\\ce+dg&cf+dh\end{matrix}\right)$$ |
| **Skills**1. For the matrices$A= \left(\begin{matrix}1&2\\4&2\end{matrix}\right)$,$B= \left(\begin{matrix}4&1&7\\2&3&5\end{matrix}\right)$, $C= \left(\begin{matrix}1&2&3\\2&0&-2\\3&3&1\end{matrix}\right)$ and $D= \left(\begin{matrix}2&1&1\\4&0&0\\3&6&2\end{matrix}\right)$ work out the following where they exist.
	1. $AB$ b. $A+B$ c. $BC$ d. $BC$ e. $B-C$ f. $CD^{2}$
2. What linear transformation does the following matrix represent?

 $M= \left(\begin{matrix}3&0\\0&3\end{matrix}\right)$1. A triangle $T$ has co-ordinates$\left(-3,0\right), \left(0,5\right), (3,0)$. Plot these and plot the vertices of the image of $T$ under the transformation represented by the matrix $M= \left(\begin{matrix}1&-1\\1&1\end{matrix}\right)$.
 | **Stretch**A matrix $A$ is called nilpotent if $A^{k}=0.$ The smallest $k$ such that $A^{k}=0$ is known as the degree. The following matrices are nilpotent, find their degree. $B= \left(\begin{matrix}0&1\\0&0\end{matrix}\right)$ $C= \left(\begin{matrix}0&3&4\\0&0&5\\0&0&0\end{matrix}\right)$ $D= \left(\begin{matrix}5&-3&2\\15&-9&6\\10&-6&4\end{matrix}\right)$ |

**Matrix Operations Homework**