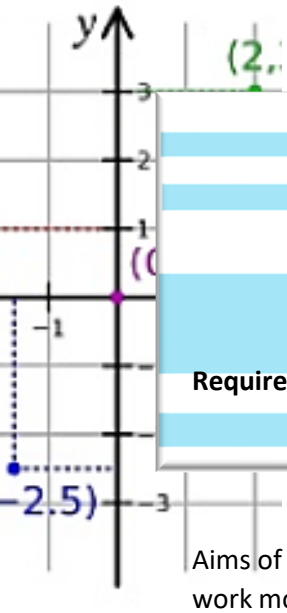


GCSE Maths

ASSIGNMENT

Preparatory Sheet

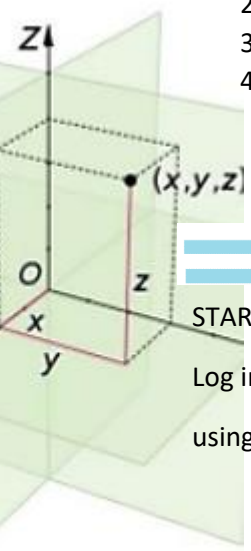
Required preparation for the session on……

TRANSFORMATIONS AND VECTORS

Aims of this session: Review your abilities in each of these areas, Green (feel confident...G), Amber (need to work more on...A), Red (Feel weaker at this...R)

G A R

1. Describe a transformation (rotate, reflect, translate, enlarge)
2. Understand vector notations to move shapes (translate)
3. Use column vectors to add/subtract and multiply
4. Reflect objects using lines x=a, y=b and x=y



MOSTLY GREEN ☐ MOSTLY ORANGE ☐ MOSTLY RED ☐

START

Log into 'Moodle'. Watch the video/s, read and practice

using the online materials. Read your GCSE maths AQA book

Links for Symmetry

https://padlet.com/mathsman230774/lj6j1gwdgu7c

https://padlet.com/mathsman230774/jcr4odgfnjri

https://padlet.com/mathsman230774/ltvgu83hdn50

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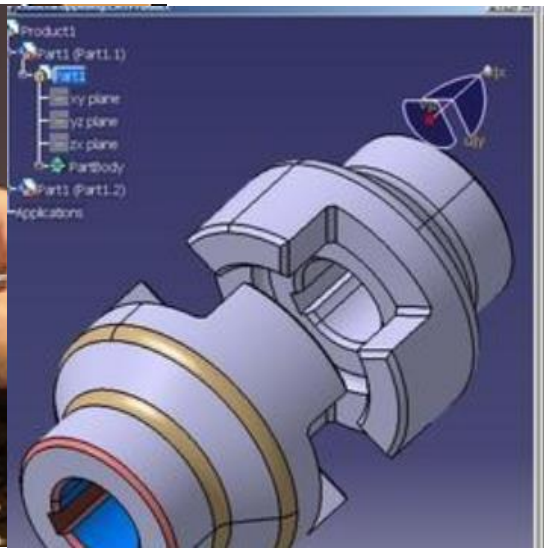
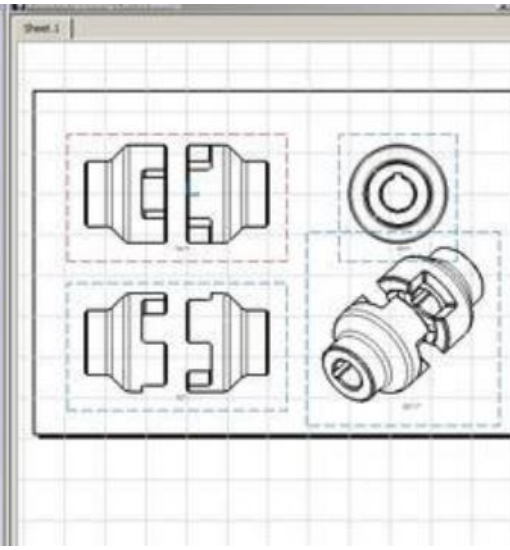




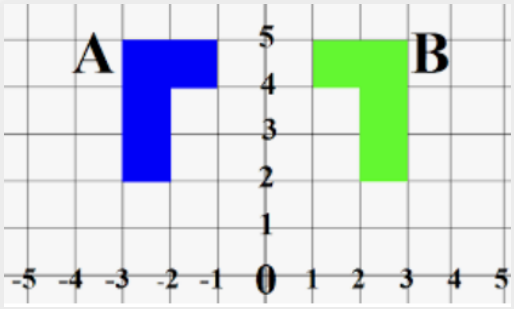
1.

Describe a transformation (rotate, reflect, translate, enlarge)

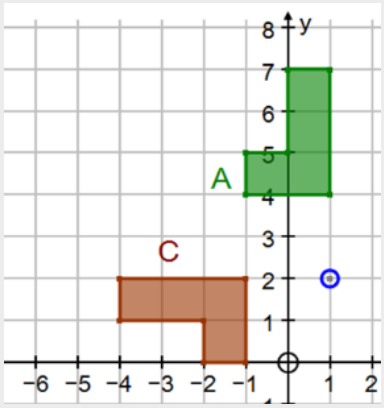
Q….Shapes and objects can be visualised in 2D and 3D mathematically using a coordinate system invented in the 17th century by René Descartes . We can use this system to draw shapes and objects, describe where they are and how they are oriented. We can then move, rotate, reflect and enlarge these shapes and simulate these onto a computer screen to produce visuals for movies/tv/games/simulations etc.

Look at each of the images below and decide if you think the shapes have been rotated …. Reflected … enlarged … or translated (moved).

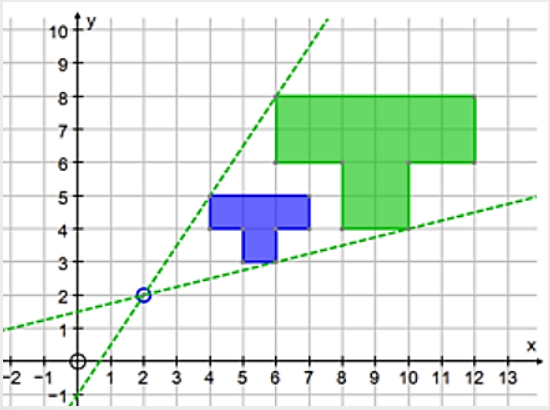
1)



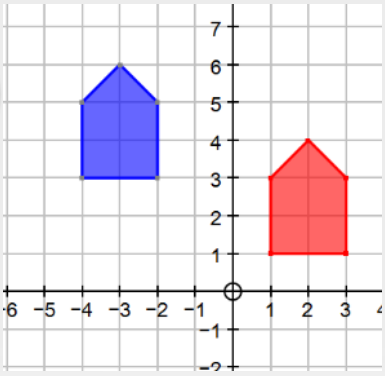
2)



3)



4)

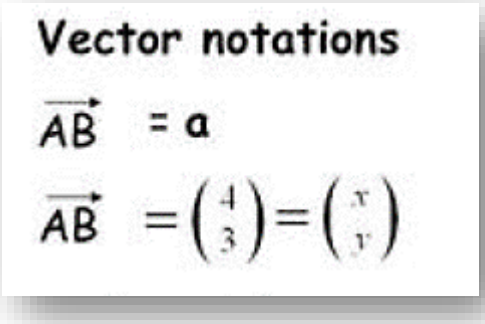


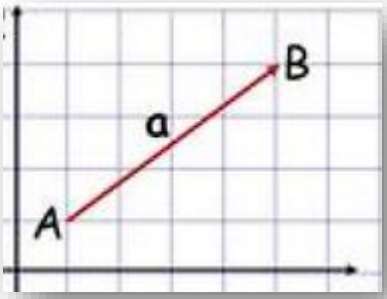
Hint… If you are not sure here, then this is your chance to look each of these terms up and get familiar with each of these four types of transformations.

2. https://padlet.com/mathsman230774/lp7mso2pmlds

Understand vector notations to move shapes (translate)

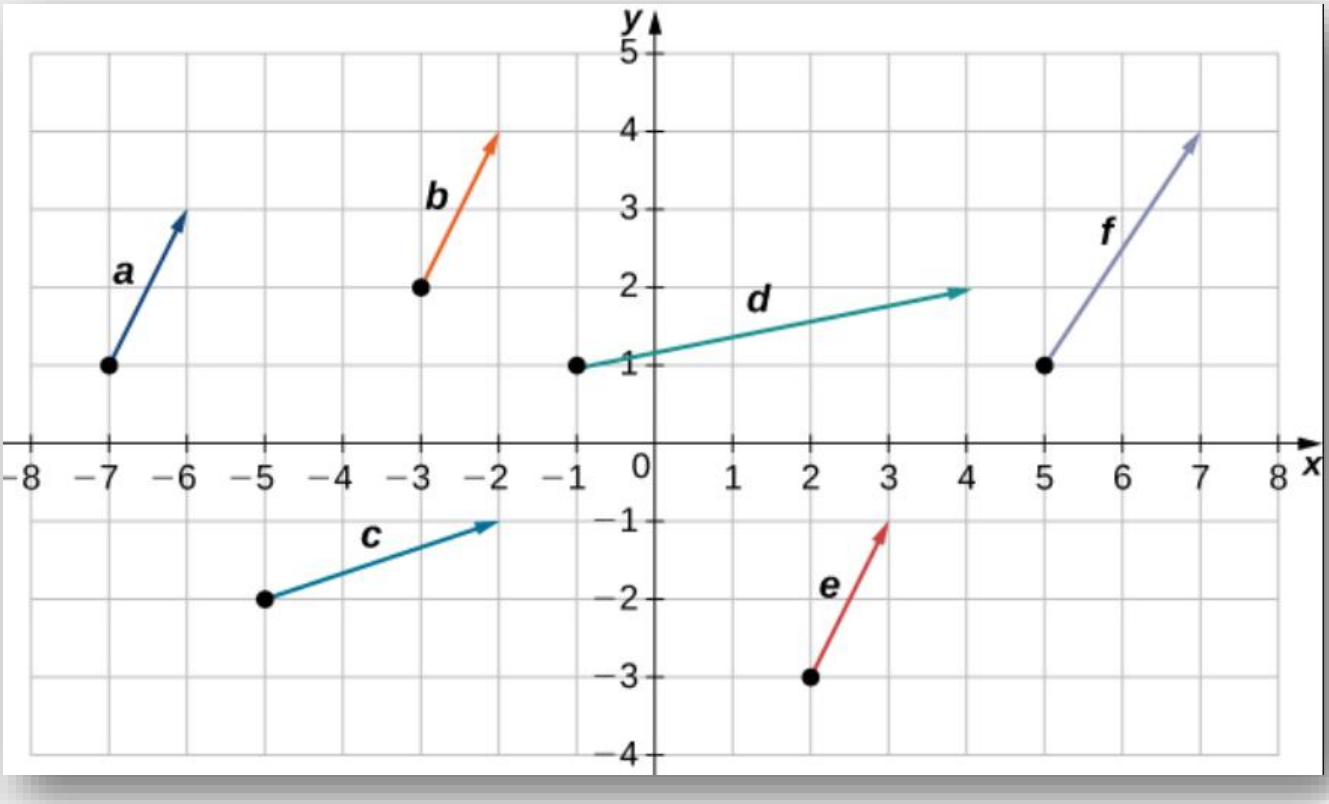
When we move shapes around we are able to describe this movement in terms of how far in the 'x' direction and 'y' direction you have moved. They can be written in a bracket format like this





The above means you have moved from point A to point B by going +4 in the 'x' direction while at the same time going +3 in the 'y' direction.

Look below and write in vector form the movements shown by the arrows.



Extension: can you write the vectors for the arrows pointing in the other directions ? What happens if you travel twice as far along the arrows?

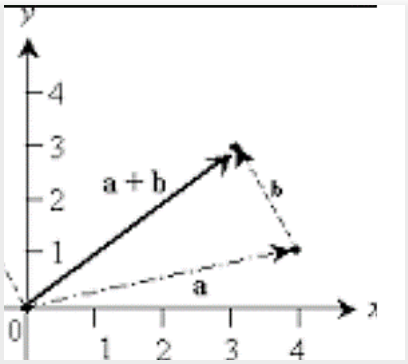
Hint… count how far up and how far across you have travelled

3.

Use column vectors to add/subtract and multiply

Q… When moving around and describing the movement of shapes in 2D we can move more than once. You are able to describe the overall distances moved in both the 'x' and 'y' directions after this combined movement.

The example below shows a movement by two vectors 'a' and 'b'. Can you write a new vector for the addition of the two vectors (a+b)



Hint… write out the vectors for both 'a' and 'b'. Add together the numbers in the 'x' direction for both lines, this becomes the new 'x' value in the 'a+b' vector. Then add together the numbers in the 'y' direction for both lines, this becomes the new 'y' value in the 'a+b' vector!

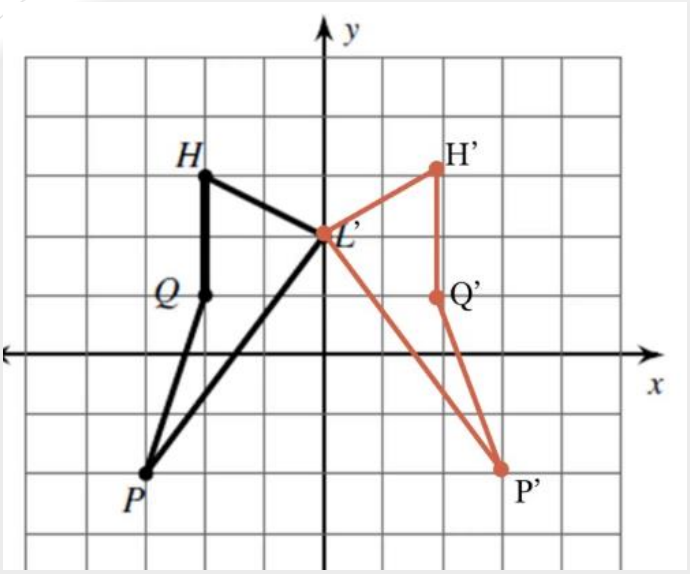
4.

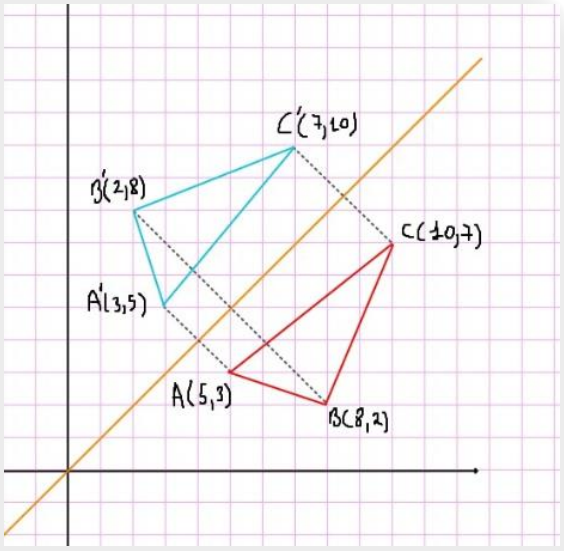
Reflect objects using lines x=a, y=b and x=y

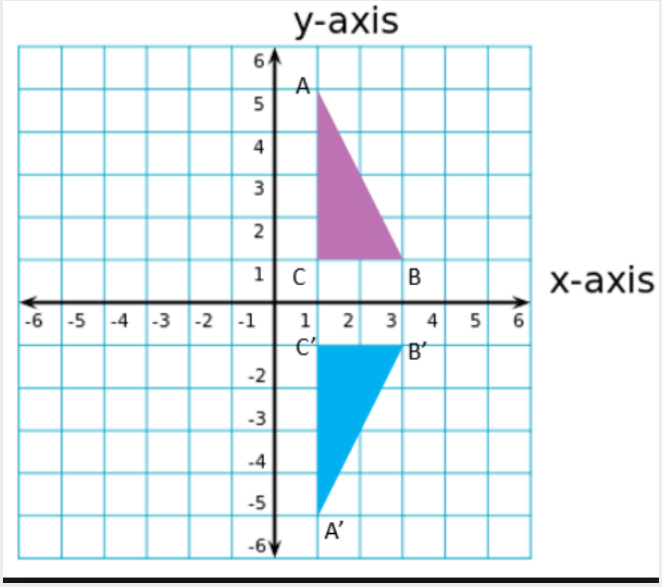
Q… When reflecting shapes on the coordinate plane we can describe how the shape has been reflected by stating where the 'mirror line' is. A mirror line is just the line on the coordinate grid that shows where the 2D shape has been reflected through. It is usually a 'Dashed' line.

This 'mirror line' can be describe by stating that it is the 'x-axis' or 'y-axis' or any other straight line on the coordinate grid. These other lines have equations. A simple straight line equations is y=x. This is a diagonal line from the origin at 45degrees.

Look at the shapes that have been reflected and state when lines you think they have been reflected through.







Hint…a left to right reflection is through the y axis. A top to bottom reflection is through the x axis. A diagonal flip is through y=x.

END OF PREPATORY ASSIGNMENT

What to do now….

1. **Ensure you have marked in each box if you feel confident in each topic or not (this will inform you and your tutor which activities you should do in the session)**
2. **Bring this yellow assignment with you to your next session and check with your tutor answers given**
3. **Add this to your folder of work IN ORDER YELLOW…GREEN… (and any BLUE you achieve)!**