Edexcel B (R)

Vectors and transformation geometry

2022 International GCSE Advance Information

Sparx Topics & Key Questions

We are always looking for ways to support maths teachers and students. In order to help you and your year 11s this year we've pulled together a list of key questions which may be useful to practise with your students based on the exam board topic lists.

These 14 key questions are all taken from our library of over 45,000 high-quality questions in Sparx Maths. If you are a Sparx Maths School then your students can use the Topic Codes provided to search the full content library directly within the independent learning section of Sparx Maths to help target their revision.

Please note this is not an exhaustive topic guide it is simply designed to help you pull together some key questions to use to check for understanding in lessons, starters, or as worksheets with your learners.

Vectors and transformation geometry	Topics	Sparx Topic Codes
Vectors	Apply vectors to geometrical problems	B606
	Modulus of a vector	B379
Transformations	Transformations	B429, B185, B157, B233, B311

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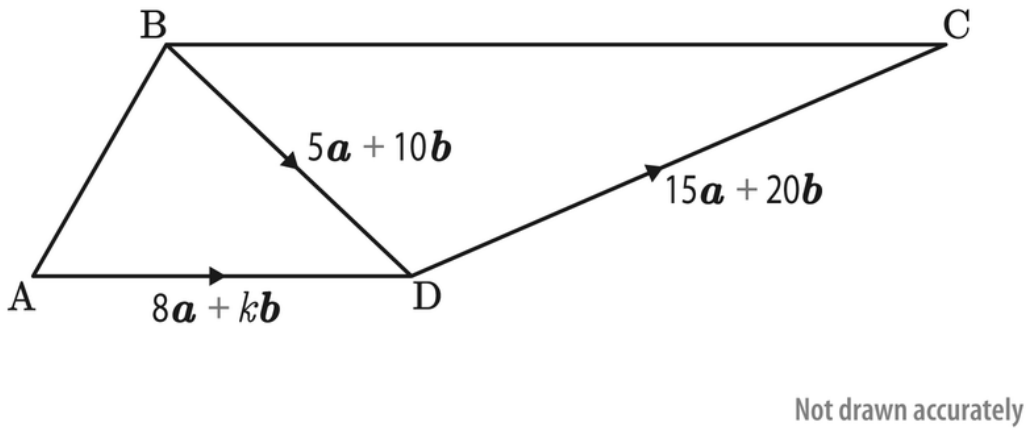
Vectors - Apply vectors to geometrical problems

Solving geometric problems using vectors B606

ABCD is a trapezium, where AD is parallel to BC.

$$\overrightarrow{\mathrm{AD}} = 8\boldsymbol{a} + k\boldsymbol{b} \qquad \overrightarrow{\mathrm{BD}} = 5\boldsymbol{a} + 10\boldsymbol{b} \qquad \overrightarrow{\mathrm{DC}} = 15\boldsymbol{a} + 20\boldsymbol{b}$$

Given that k is a scalar quantity, work out the value of k.



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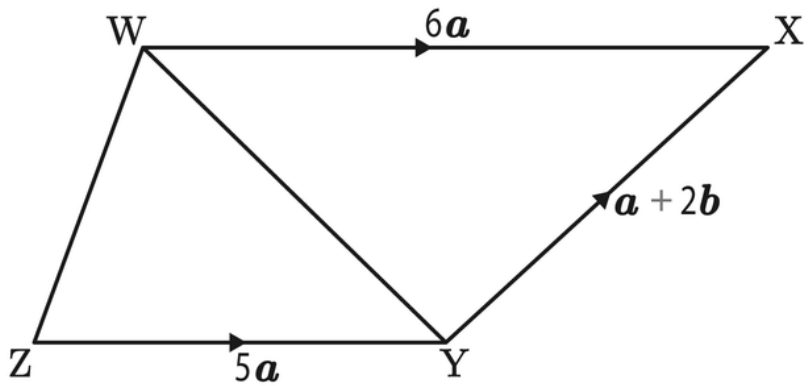
WXYZ is a trapezium.

$\overrightarrow{ZY} = 5\boldsymbol{a}$ $\overrightarrow{YX} = \boldsymbol{a} + 2\boldsymbol{b}$ $\overrightarrow{WX} = 6\boldsymbol{a}$

P is a point on YW such that $\overrightarrow{YP} = \frac{1}{5}\overrightarrow{YW}$.

Express $\overrightarrow{ZP}$ in terms of $\boldsymbol{a}$ and $\boldsymbol{b}$.
Fully simplify your answer, giving any values as integers or fractions.



Not drawn accurately

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Vectors - Modulus of a vector

Magnitude, position and unit vectors B379

The position vector of point A is $\begin{pmatrix} 15 \\ 9 \end{pmatrix}$.

$$\overrightarrow{\mathrm{AB}} = \begin{pmatrix} -5 \\ 3 \end{pmatrix}$$

Work out the position vector of point B.

$$\overrightarrow{\mathrm{XY}} = \begin{pmatrix} 3 \\ -4 \end{pmatrix}$$

a) Calculate $|\overrightarrow{\mathrm{XY}}|$.

b) Hence work out the unit vector that is parallel to and in the same direction as $\overrightarrow{\mathrm{XY}}$.

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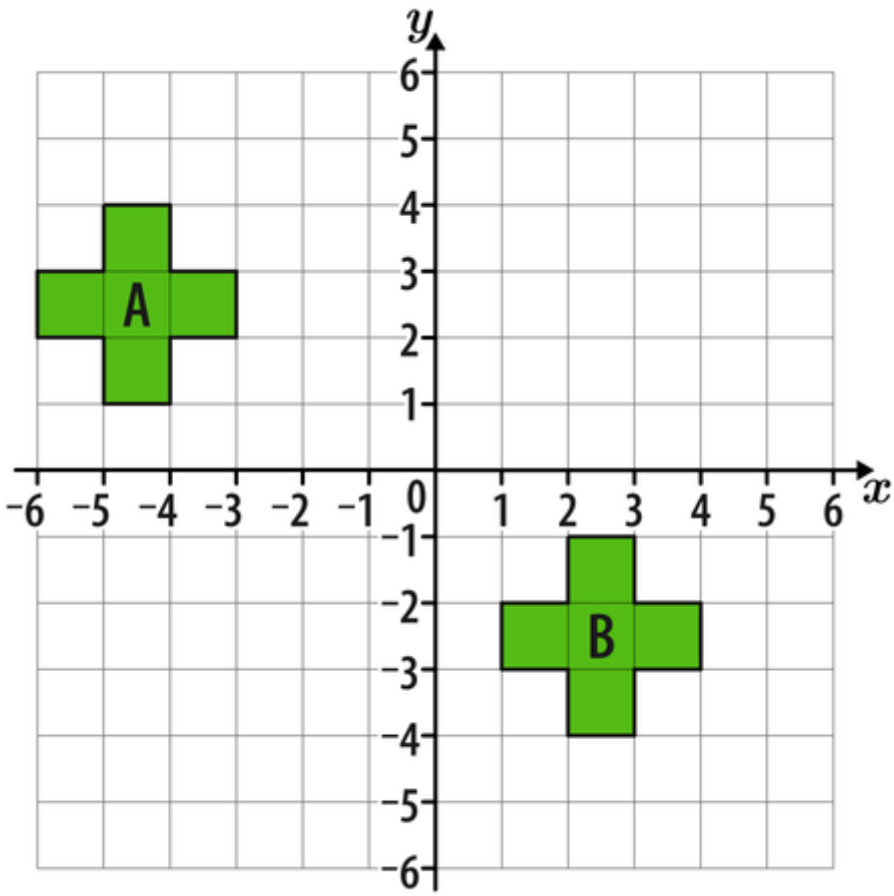
Transformations - Transformations

Translation B429

What vector describes the translation from

a) shape A to shape B?

b) shape B to shape A?



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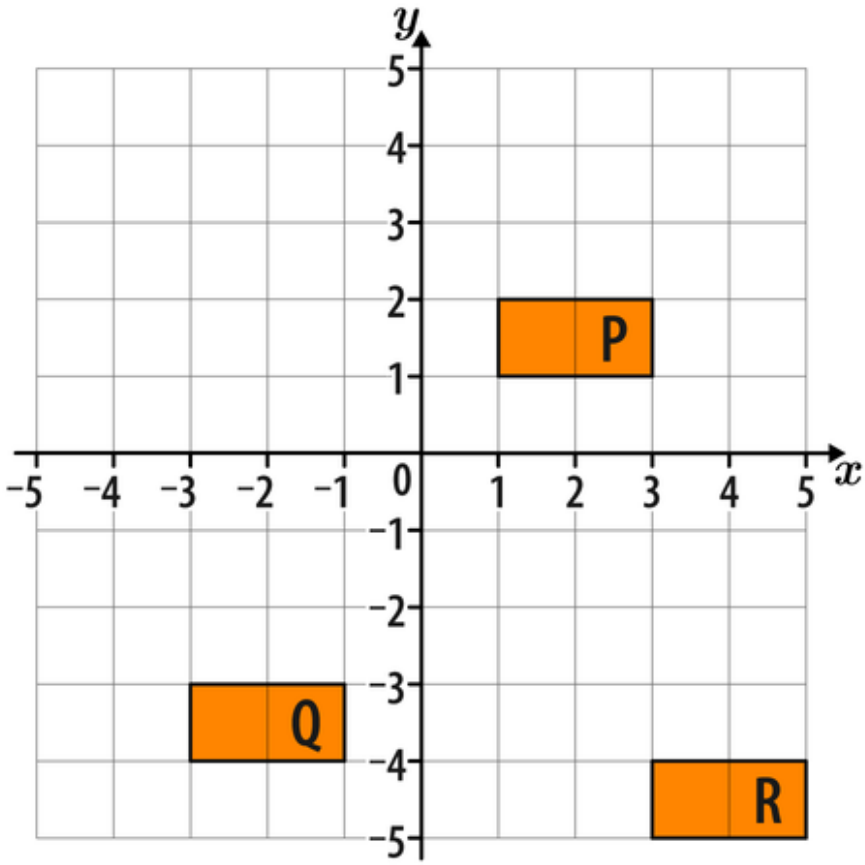
Shape P is translated by $\begin{pmatrix} -4 \\ -5 \end{pmatrix}$ to give shape Q.

Shape Q is translated by $\begin{pmatrix} 6 \\ -1 \end{pmatrix}$ to give shape R.

a) Using the grid, work out the vector that describes the translation from shape P to shape R.

b) Can you work out this vector without using the grid? Write a sentence to explain your answer.



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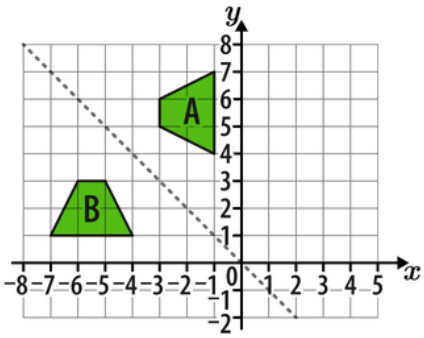
Reflection B185

Copy and complete both sentences below.



Shape B is a reflection of shape A in the line with equation ☐

Shape A is a reflection of shape B in the line with equation ☐

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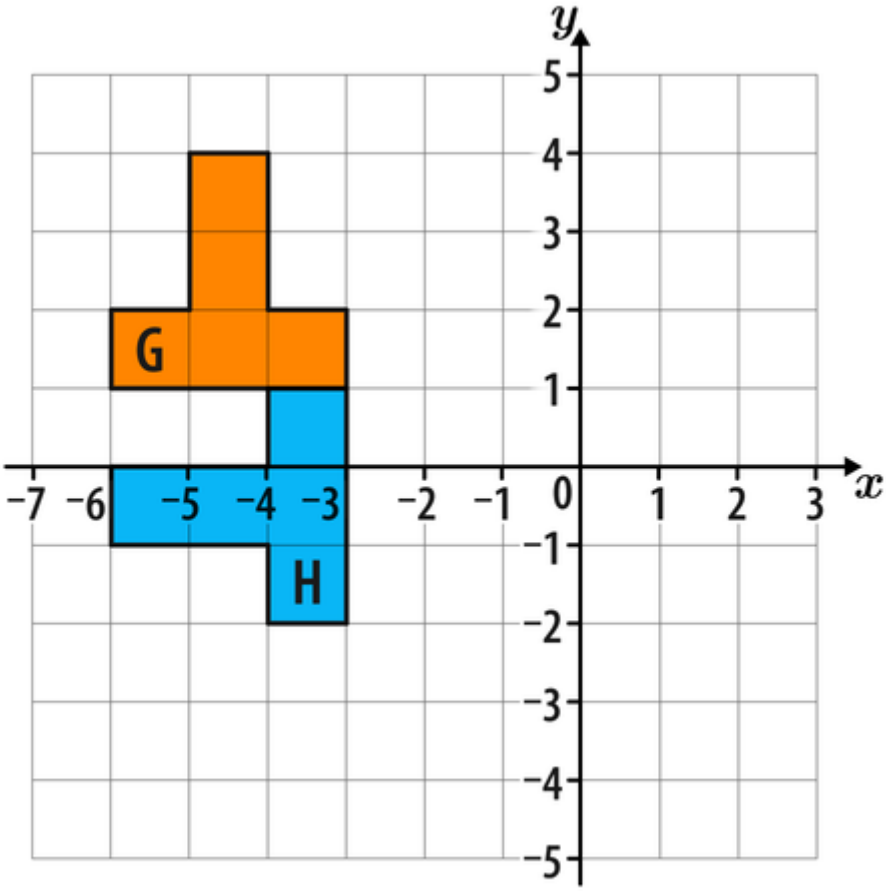
Rotation **B157**

Shape G has been rotated clockwise/anticlockwise by ____ °

about the point (____ , ____) to give shape H.



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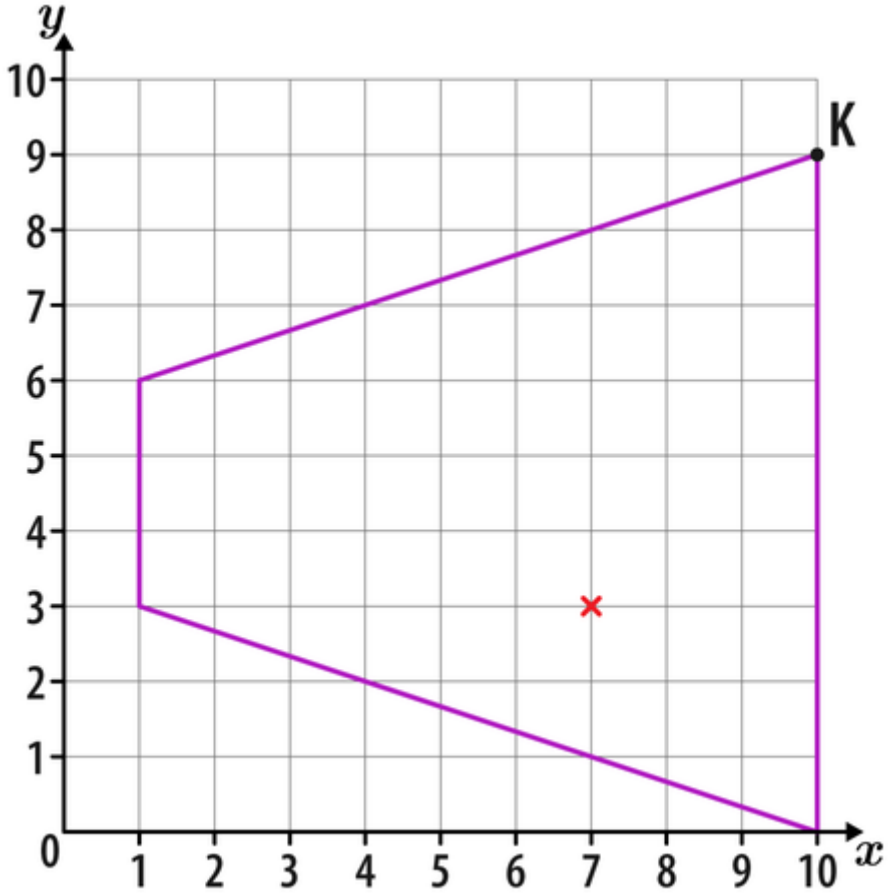
Enlargement **B233**

This shape is being enlarged using a scale factor of $\frac{1}{3}$ and centre $(7, 3)$.

What are the coordinates of the vertex of the new shape that corresponds to K?



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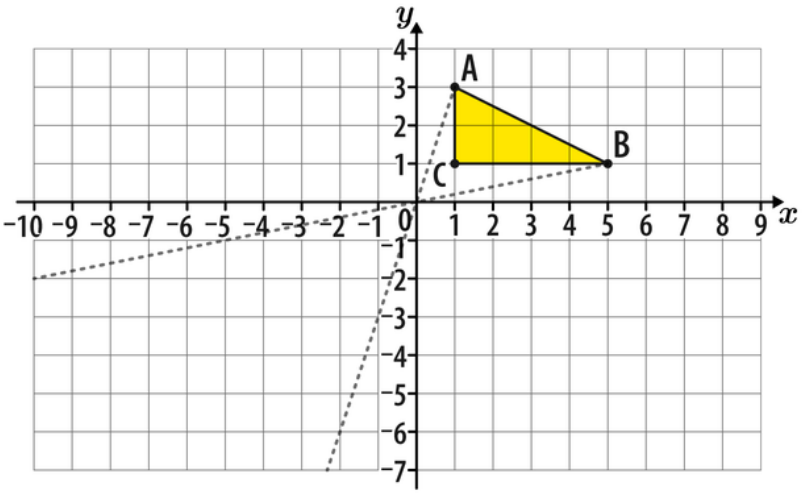
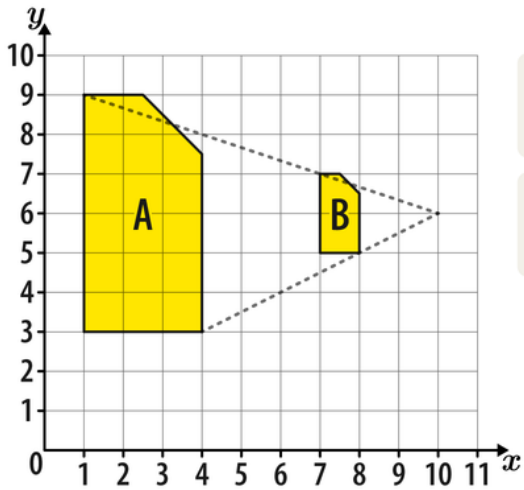
Triangle ABC is being enlarged using a scale factor of -2 and the origin as the centre to give triangle $A'B'C'$.

Work out the coordinates of A' and B'.



Complete the sentences below to fully describe the enlargements.



A to B: Enlargement with a scale factor of ☐ and centre (☐ , ☐)

B to A: Enlargement with a scale factor of ☐ and centre (☐ , ☐)

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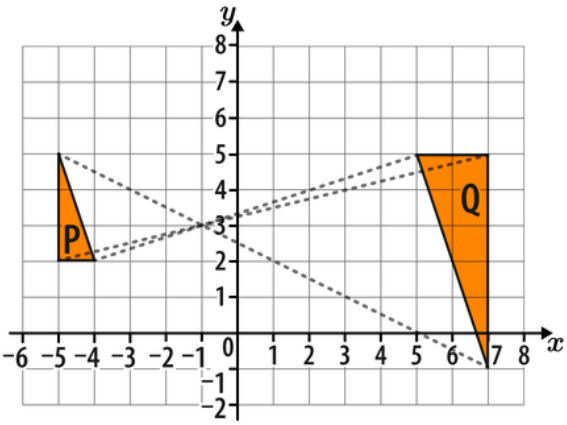
Complete the sentence below to fully describe the transformation that maps triangle P onto triangle Q.



Enlargement with a scale factor of ☐ and centre (☐ , ☐)

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Combining transformations

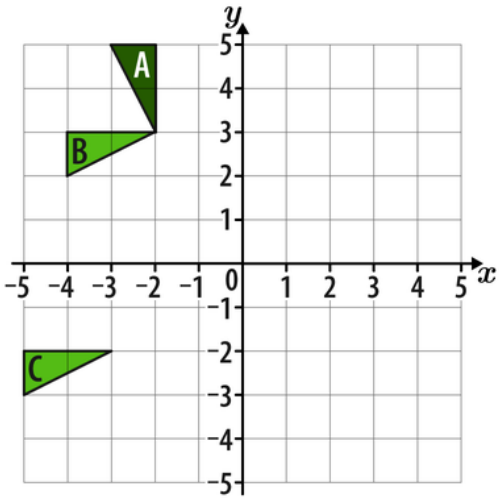
B311

Fill in the gaps below to describe the transformations

a) from A to B.

b) from B to C.

c) from A to C.



A to B	A rotation by ____ ° anticlockwise about (____ , ____)
B to C	A translation by vector $\begin{pmatrix} __ \\ __ \end{pmatrix}$
A to C	A rotation by ____ ° clockwise / anticlockwise about (0, 0)

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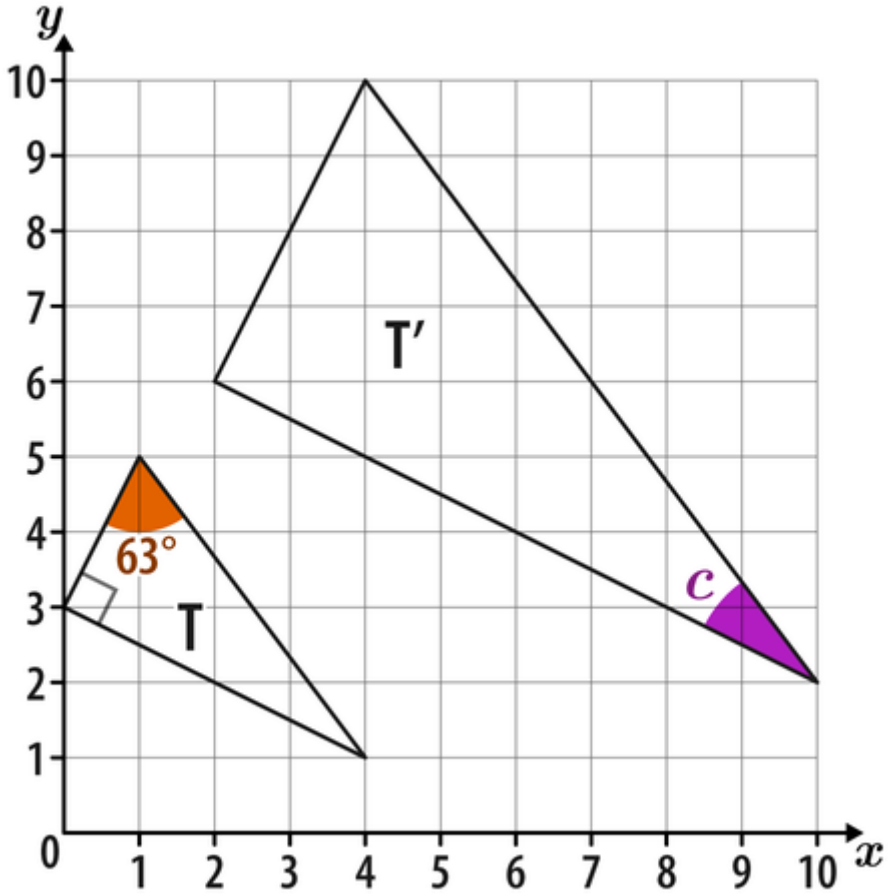
Triangle T has been translated by $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ and then enlarged by a scale factor of 2 using $(2, 6)$ as the centre.

What is the size of angle c?



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