Congruence and similarities – 2021/20 GCSE Mathematics Higher

1. Nov/2021/Paper_J560/05/No.14

Two solid ornaments are mathematically similar.
The larger ornament is twice as tall as the smaller ornament.

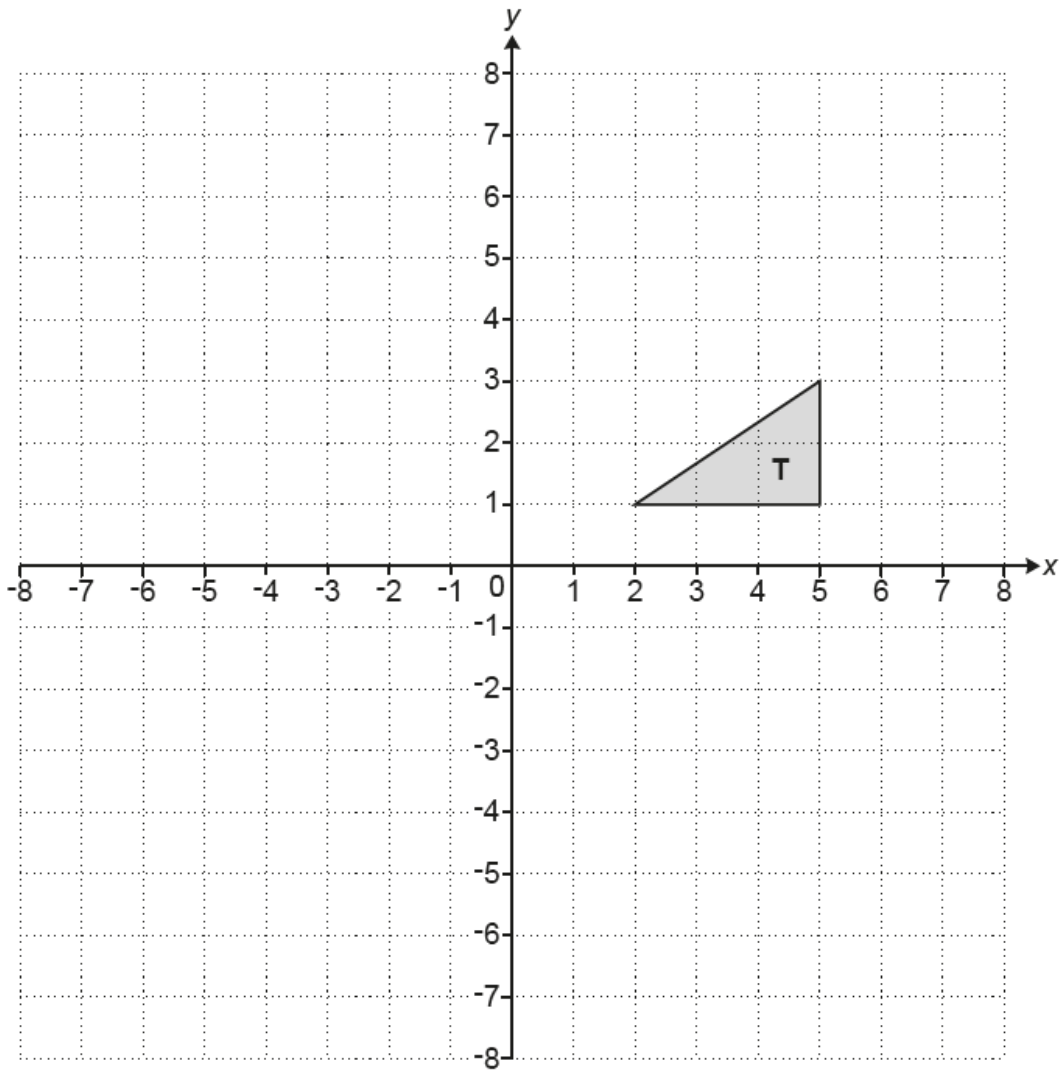
The smaller ornament has a volume of 50 cm^3.

Work out the volume of the larger ornament.

..... cm^3 **[2]**

2. Nov/2020/Paper_J560/04/No.12

Triangle **T** is drawn on a coordinate grid.



(a) Translate triangle **T** by vector $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$. **[2]**

(b) Describe fully the **single** transformation that is equivalent to:

- a reflection in the line $y = x$, followed by
- a reflection in the x-axis.

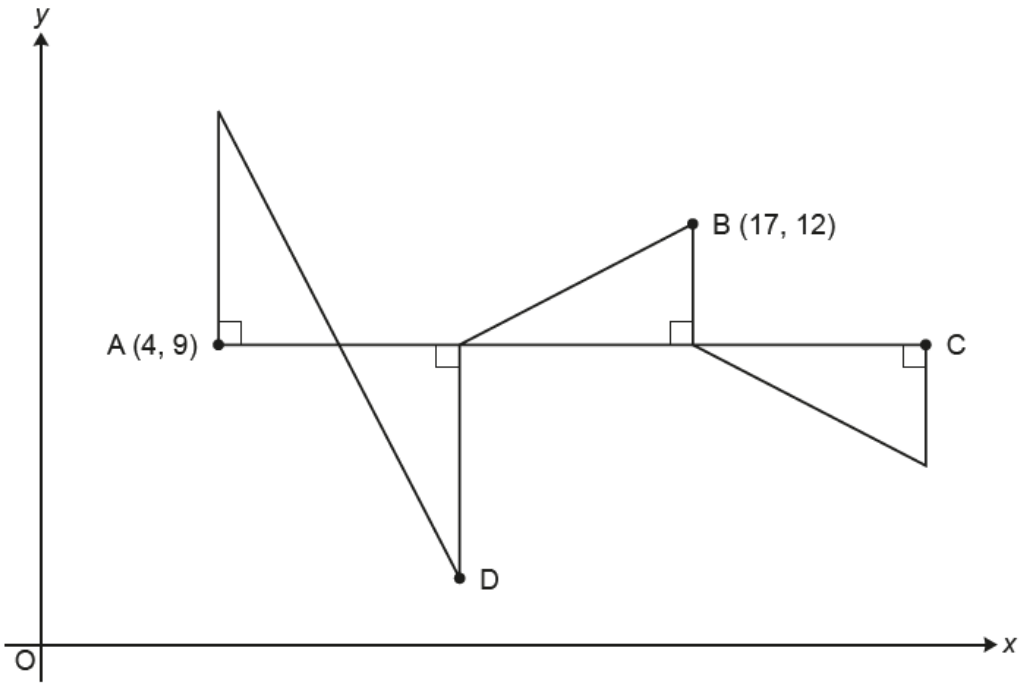
You may use the grid above to help you.

.....

..... **[3]**

3. Nov/2020/Paper_J560/05/No.7

A pattern is made from four congruent right-angled triangles.



Not to scale

The line AC is parallel to the *x*-axis.
The point A has coordinates (4, 9) and the point B has coordinates (17, 12).

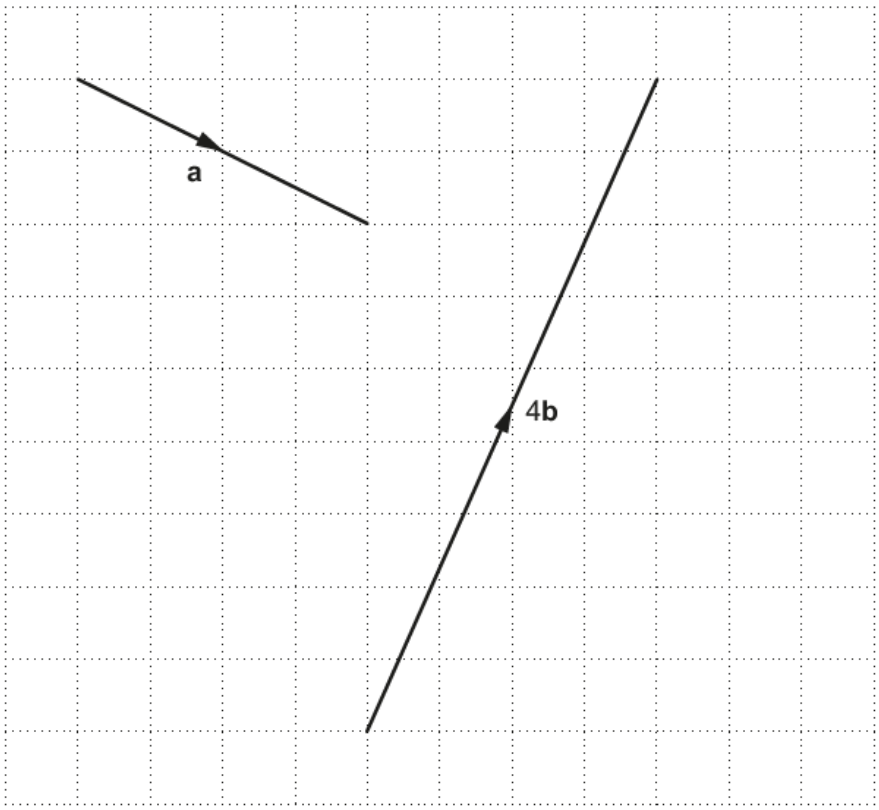
Work out the coordinates of point C and point D.

C (..... , ...)

D (..... , ...) **[5]**

4. Nov/2020/Paper_J560/06/No.7

Vectors **a** and 4**b** are drawn on the grid.



(a) Write vector **a** as a column vector.

(a) ( ) **[2]**

(b) Find vector **b** as a column vector.

(b) ( ) **[2]**

5. Nov/2020/Paper_J560/06/No.20

Vector $\mathbf{m} = \begin{pmatrix} 2 \\ k \end{pmatrix}$ and vector $\mathbf{n} = \begin{pmatrix} 3 \\ 11 \end{pmatrix}$.

Vector $2\mathbf{m} + \mathbf{n}$ is parallel to $\begin{pmatrix} 1 \\ -1 \end{pmatrix}$.

Find the value of k.

$k =$ ..... **[4]**