**End of Unit Test** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Transformations - HIGHER**

1) The shape is **rotated** 90° clockwise about point *A*.

It is then **enlarged** by scale factor −2, centre *B*.

Draw the final shape on the diagram.



**(Total 3 marks)**

2) Square *OABC* is drawn on a centimetre grid.

*O* is (0, 0)     *A* is (2, 0)     *B* is (2, 2)     *C* is (0, 2)



(a) *OABC* is translated by the vector $\left(\begin{matrix}3\\1\end{matrix}\right)$

Circle the number of invariant points on the perimeter of the square.

0                           1                           2                           4

**(1)**

(b) *OABC* is enlarged, scale factor 2, centre (0, 0)

Circle the number of invariant points on the perimeter of the square.

0                           1                           2                           4

**(1)**

(c) *OABC* is reflected in the line *y* = *x*

Circle the number of invariant points on the perimeter of the square.

0                           1                           2                           4

**(1)**

**(Total 3 marks)**

3) The diagram shows shapes A and B.



Shape A is mapped onto shape B by a reflection in one of the axes followed by a rotation.

Complete the sentence.

Shape A is mapped onto shape B by a reflection in .........................................................

followed by a rotation .........................................................................................................

**(Total 3 marks)**

4) **a** = $\left(\begin{matrix}5\\-2\end{matrix}\right)$ **b** = $\left(\begin{matrix}-2\\3\end{matrix}\right)$

  Circle the vector **a** – **b**

$\left(\begin{matrix}-3\\-5\end{matrix}\right)$ $\left(\begin{matrix}7\\1\end{matrix}\right)$ $\left(\begin{matrix}3\\1\end{matrix}\right)$ $\left(\begin{matrix}7\\-5\end{matrix}\right)$

  **(Total 1 mark)**

5) Here are two column vectors.

**f** = $\left(\begin{matrix}4\\5\end{matrix}\right)$ **g** = $\left(\begin{matrix}5\\-2\end{matrix}\right)$

Work out     3**f** − 2**g**

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Answer ...................................................................................

**(Total 2 marks)**

6) In triangle *ABC*

*M* is the midpoint of *AC*

*N* is the point on *BC* where *BN* : *NC* = 2 : 3



(a) Work out      in terms of **a** and **b**.

Give your answer in its simplest form.

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Answer ............................................

**(3)**

(b) Use your answer to part (a) to explain why *MN* is **not** parallel to *AB*.

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**(1)**

**(Total 4 marks)**

7) *ABCDE* is a pentagon.
*M* is the midpoint of *BC*.
*N* is the midpoint of *CD*.



 = *x*

** = *y*

(a) Show that *MN* is parallel to *BD*.

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 **(3)**

(b) Write down the ratio *BD* : *MN* in its simplest form.

Answer      .......... : ..........

**(1)**

**(Total 4 marks)**

 **(Total for test = 20 marks)**