GCSE (1 – 9)

Enlargement by a Negative Scale Factor

Instructions

• Use black ink or ball-point pen.
• Answer all questions.
• Answer the questions in the spaces provided
  – there may be more space than you need.
• Diagrams are NOT accurately drawn, unless otherwise indicated.
• You must show all your working out.

Information

• The marks for each question are shown in brackets
  – use this as a guide as to how much time to spend on each question.

Advice

• Read each question carefully before you start to answer it.
• Keep an eye on the time.
• Try to answer every question.
• Check your answers if you have time at the end

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On the grid, enlarge the triangle by scale factor -2. centre (0,1)

(Total for question 1 is 2 marks)

\[
\begin{align*}
\begin{pmatrix} 2 \\ 1 \end{pmatrix} & \times -2 = \begin{pmatrix} -4 \\ -2 \end{pmatrix} \\
\begin{pmatrix} 4 \\ 1 \end{pmatrix} & \times -2 = \begin{pmatrix} -8 \\ -2 \end{pmatrix} \\
\begin{pmatrix} 3 \\ 4 \end{pmatrix} & \times -2 = \begin{pmatrix} -6 \\ -8 \end{pmatrix}
\end{align*}
\]
On the grid, enlarge the triangle by scale factor -2. centre $O$

(Total for question 2 is 2 marks)

\[
\begin{align*}
\begin{pmatrix} 1 \\ -1 \end{pmatrix} \times -2 &= \begin{pmatrix} -2 \\ 2 \end{pmatrix} \\
\begin{pmatrix} 3 \\ -1 \end{pmatrix} \times -2 &= \begin{pmatrix} -6 \\ 2 \end{pmatrix} \\
\begin{pmatrix} 2 \\ -4 \end{pmatrix} \times -2 &= \begin{pmatrix} -4 \\ -8 \end{pmatrix}
\end{align*}
\]
On the grid, enlarge the triangle by scale factor -3. centre (4,-4)

(Total for question 3 is 2 marks)

\[
\begin{align*}
(1) \quad x - 3 &= (-3) \\
(-3) \quad x - 3 &= (9) \\
(3) \quad x - 3 &= (-9) \\
(-2) \quad x - 3 &= (6) \\
(3) \quad x - 3 &= (-9) \\
(-3) \quad x - 3 &= (9)
\end{align*}
\]
Describe fully the single transformation which maps triangle A onto triangle B.

Enlargement, scale factor 2, centre (-1, 0)

(Total for question 4 is 2 marks)
On the grid, enlarge the triangle by scale factor -0.5. centre (0,2)

(Total for question 5 is 2 marks)

\[
\begin{pmatrix} 2 \\ 2 \end{pmatrix} \times -0.5 = \begin{pmatrix} -1 \\ -1 \end{pmatrix}
\]

\[
\begin{pmatrix} 2 \\ 4 \end{pmatrix} \times -0.5 = \begin{pmatrix} -1 \\ -2 \end{pmatrix}
\]

\[
\begin{pmatrix} 6 \\ 2 \end{pmatrix} \times -0.5 = \begin{pmatrix} -3 \\ -1 \end{pmatrix}
\]
On the grid, enlarge the triangle by scale factor -1.5. Centre O.

(Total for question 6 is 2 marks)

\[
\begin{align*}
\begin{pmatrix} 2 \\ 1 \end{pmatrix} \times -1.5 &= \begin{pmatrix} -3 \\ -1.5 \end{pmatrix} \\
\begin{pmatrix} 4 \\ 1 \end{pmatrix} \times -1.5 &= \begin{pmatrix} -6 \\ -1.5 \end{pmatrix} \\
\begin{pmatrix} 2 \\ 4 \end{pmatrix} \times -1.5 &= \begin{pmatrix} -3 \\ -6 \end{pmatrix}
\end{align*}
\]
Describe fully the single transformation which maps triangle A onto triangle B.

- **Enlargement** scale factor \( 5 \)
- **Centre** \( (0, -2) \)

(Total for question 7 is 2 marks)