FOUNDATION & HIGHER

SAME AT BOTH TIERS

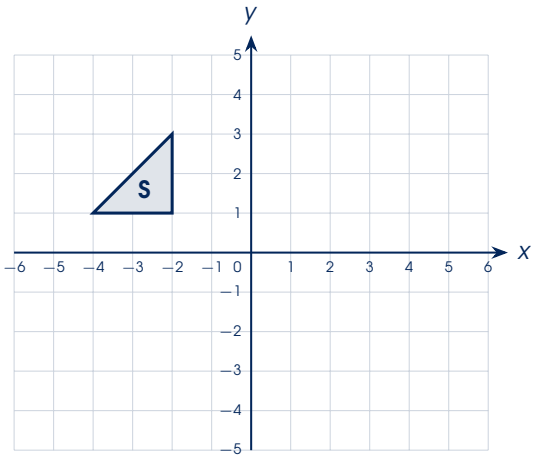
Name ..... Class .....

G24: Translation vectors

Describe translations as column vectors

20 marks · 25 minutes · Non-calculator

1) Shape S is drawn on the grid.



(a) Translate S by $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$. Label the image A.

(2)

(b) Translate S by $\begin{pmatrix} 5 \\ -6 \end{pmatrix}$. Label the image B.

(2)

[Question 1: 4 marks]

2) Write the column vector for the translation that moves $(1, 2)$ to $(5, -1)$.

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[Question 2: 1 marks]

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3) The point $(2, 3)$ is translated by $\begin{pmatrix} -5 \\ 4 \end{pmatrix}$. Where does it end up?

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[Question 3: 1 marks]

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4) A translation moves $(6, -2)$ to $(1, 3)$. Write the translation as a column vector.

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[Question 4: 1 marks]

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5) Describe in words the translation $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$.

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[Question 5: 1 marks]

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6) A shape is translated by $\begin{pmatrix} 2 \\ 5 \end{pmatrix}$ and then by $\begin{pmatrix} -7 \\ 1 \end{pmatrix}$. Write the single translation that has the same effect.

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[Question 6: 2 marks]

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7) Write the translation that reverses $\begin{pmatrix} 4 \\ -6 \end{pmatrix}$.

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[Question 7: 1 marks]

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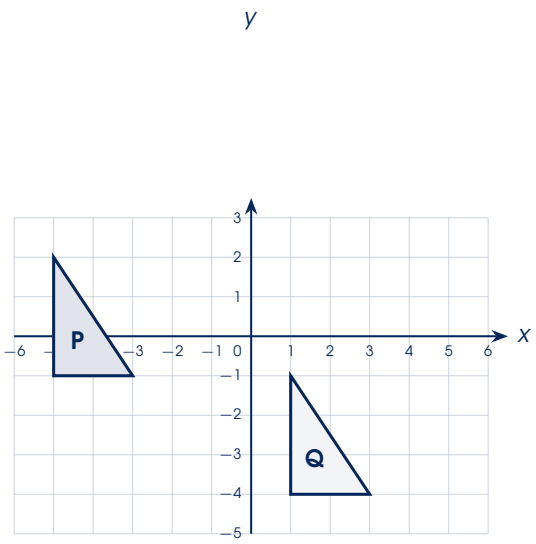
8) After a translation by $\begin{pmatrix} -2 \\ 7 \end{pmatrix}$, a point is at $(3, 3)$. Where was it before?

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[Question 8: 2 marks]

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9) Describe fully the transformation that maps shape *P* onto shape *Q*.



[Question 9: 2 marks]

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10) Find the magnitude (length) of the vector $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$.

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[Question 10: 2 marks]

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11) A shape is translated by $\begin{pmatrix} 0 \\ -3 \end{pmatrix}$. Is the image congruent to the original shape?

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[Question 11: 1 marks]

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12) The point (x, y) is translated by $\begin{pmatrix} 2 \\ -1 \end{pmatrix}$. Write down the coordinates of its image.

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[Question 12: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	(a) $(-1,-1)$, $(1,-1)$, $(1,1)$ (b) $(1,-5)$, $(3,-5)$, $(3,-3)$	B2 each (B1 for a correct translation in one direction).
2	$\begin{pmatrix} 4 \\ -3 \end{pmatrix}$	B1.
3	$(-3,7)$	B1.
4	$\begin{pmatrix} -5 \\ 5 \end{pmatrix}$	B1.
5	3 left and 2 up	B1.
6	$\begin{pmatrix} -5 \\ 6 \end{pmatrix}$	Adding components (M1); A1.
7	$\begin{pmatrix} -4 \\ 6 \end{pmatrix}$	B1.
8	$(5,-4)$	Subtract the vector (M1); A1.
9	Translation $\begin{pmatrix} 6 \\ -3 \end{pmatrix}$	B1 translation; B1 vector.
10	5	$\sqrt{9+16}$ (M1); A1.
11	Yes	B1.
12	$(x+2, y-1)$	B1 each coordinate.