Planner

Transformations

- Reflecting in vertical, horizontal and diagonal lines
- Rotating a shape about a centre of rotation
- Reflecting, rotating or translating an object on a coordinate grid
- Describing translations using column vectors

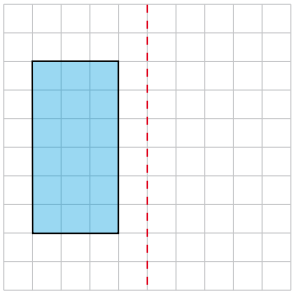
Keywords

You should know

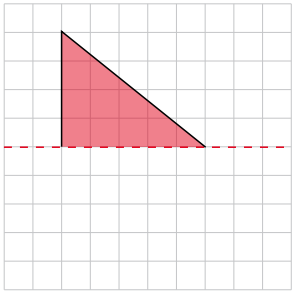
explanation 1a | explanation 1b | online

1 Copy each diagram. Reflect each shape in the dashed mirror lines.

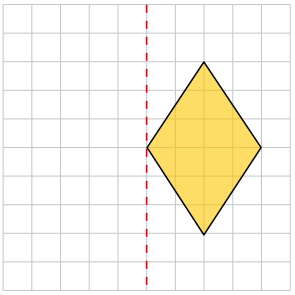
a



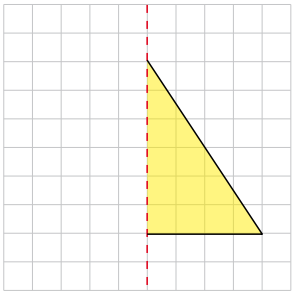
b



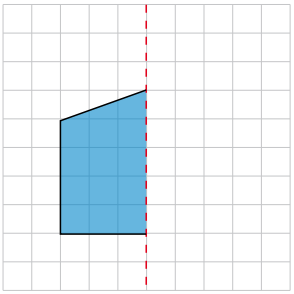
c



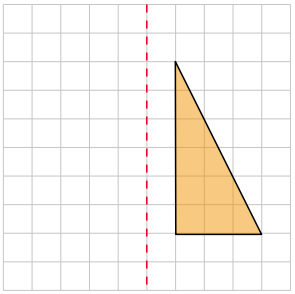
d



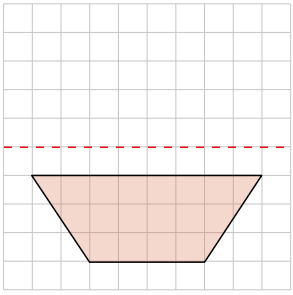
e



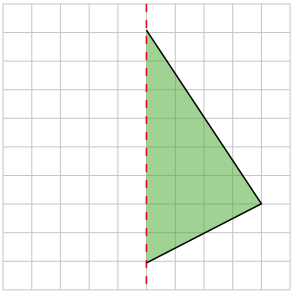
f



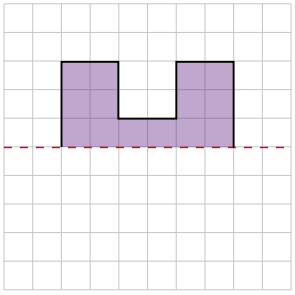
g



h

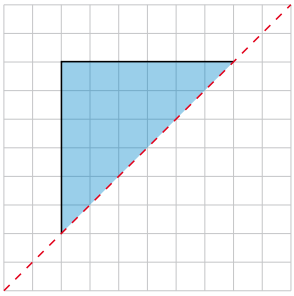


i

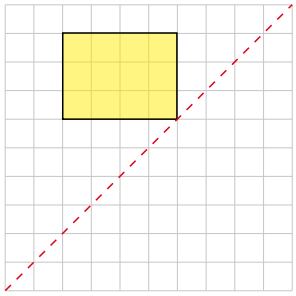


2 Copy each diagram. Reflect each shape in the diagonal mirror lines.

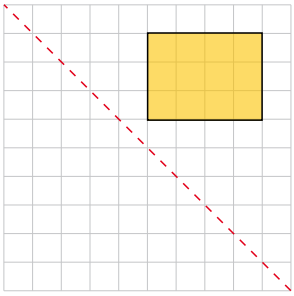
a



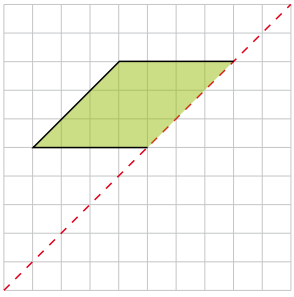
b



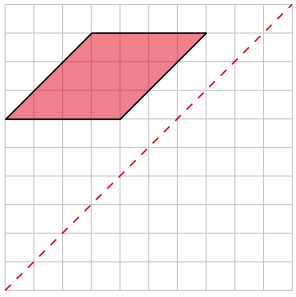
c



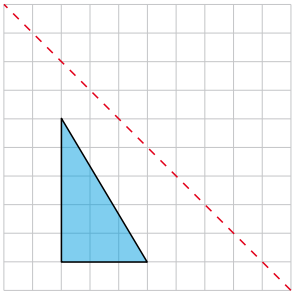
d



e

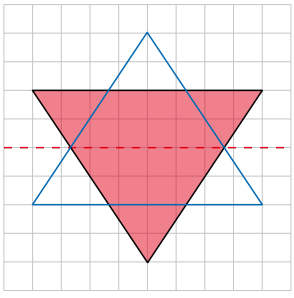


f

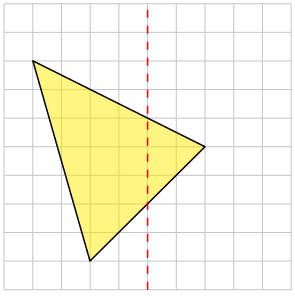


3 Copy each diagram. Reflect each shape in the dashed mirror lines.
The first reflection has been done for you.

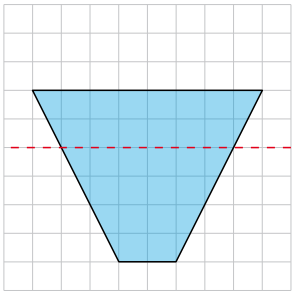
a



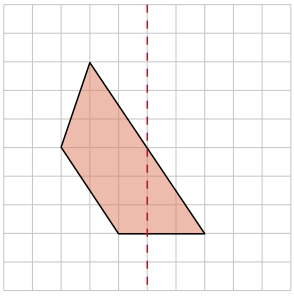
b



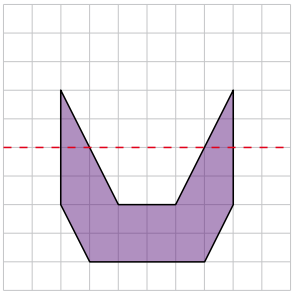
c



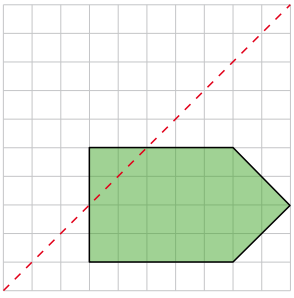
d



e

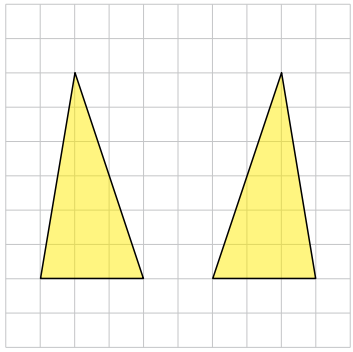


f

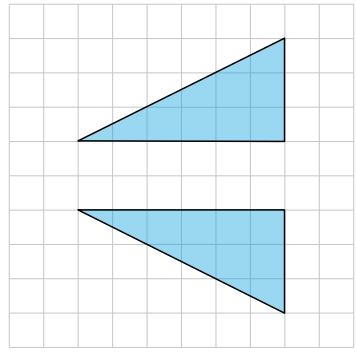


4 Copy the diagrams and draw in all of the missing mirror lines.

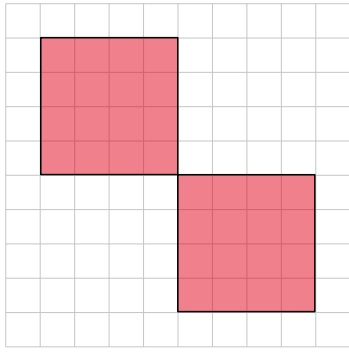
a



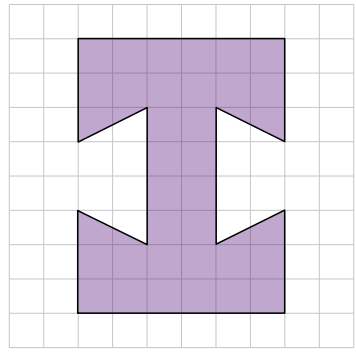
b



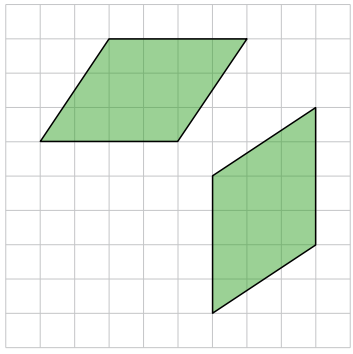
c



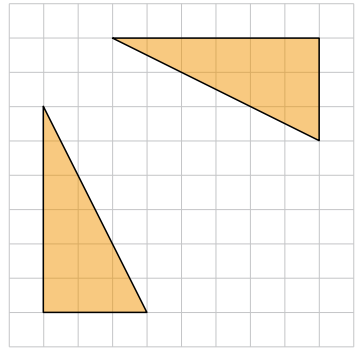
d



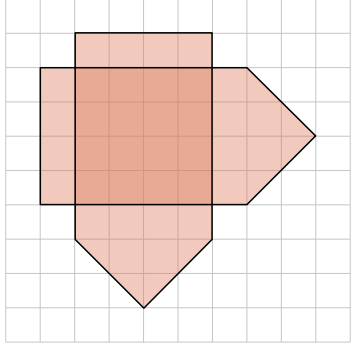
e



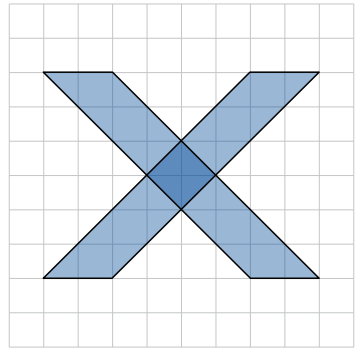
f



g

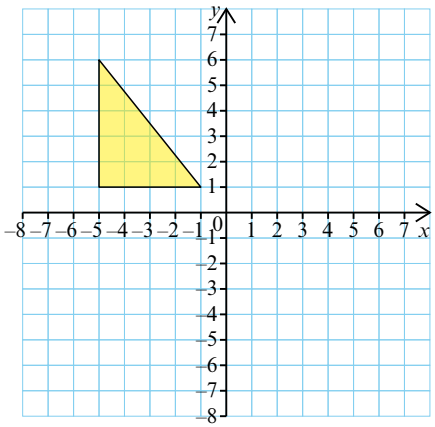


h

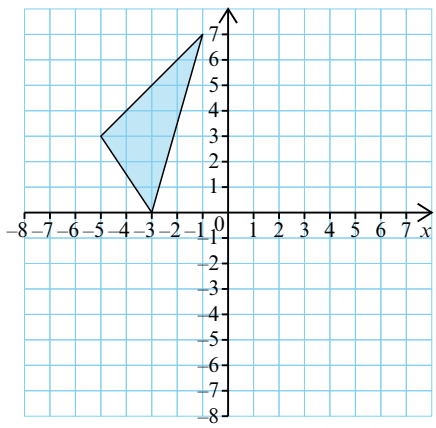


***5** Copy the diagrams and reflect the shapes in the y-axis. Label each reflection A.

a



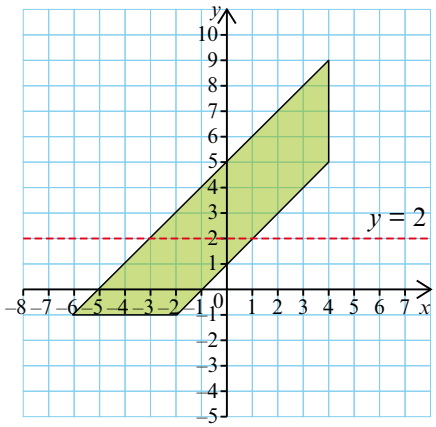
b



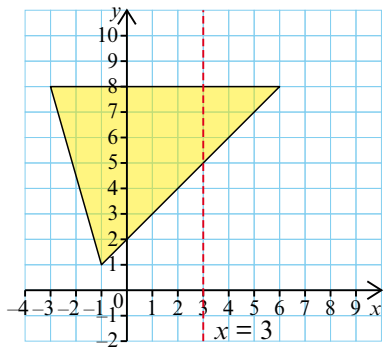
***6** Look at the diagrams you drew in question **5**.
Reflect the original shapes in the x-axis. Label each reflection B.

***7** Copy the diagrams and reflect the shapes in the dashed lines.

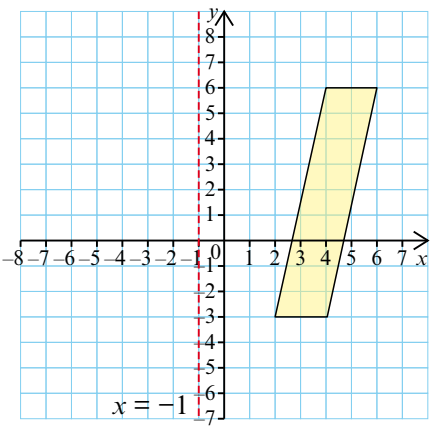
a



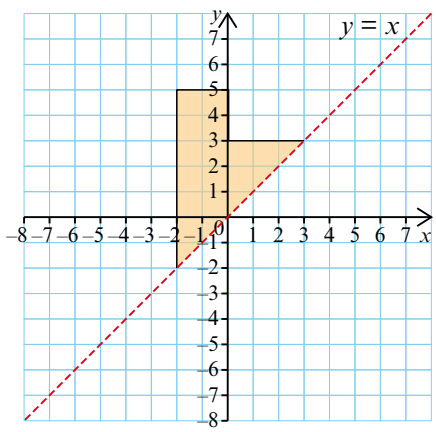
b



c



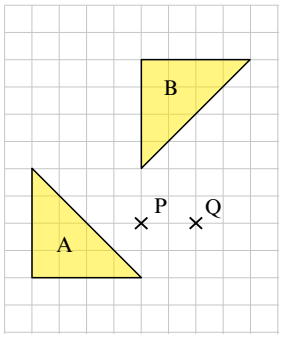
d



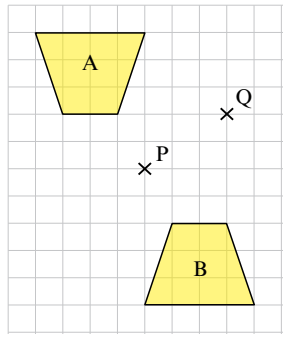
explanation 2a | explanation 2b

8 Each diagram shows a rotation that moves shape A to shape B.
Decide which marked point is the centre of each rotation.
Describe each rotation. Remember to state the angle, direction and centre.

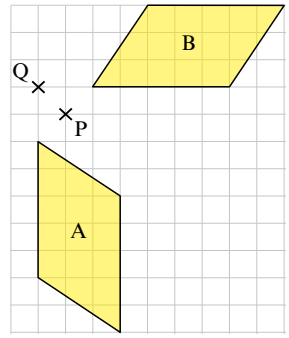
a



b

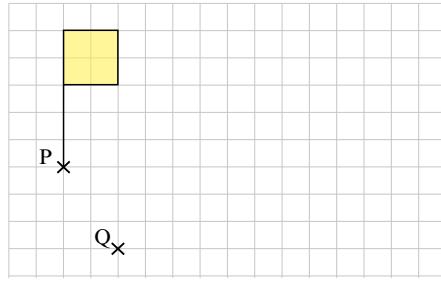


c



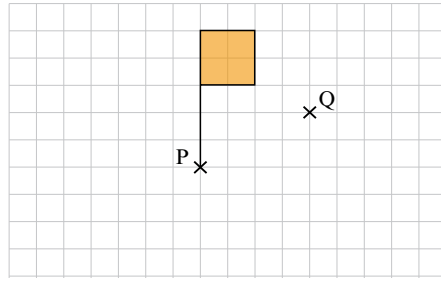
9 Copy the diagram. Show the new positions of the shape after clockwise rotations of 90° with these centres.

a P **b** Q



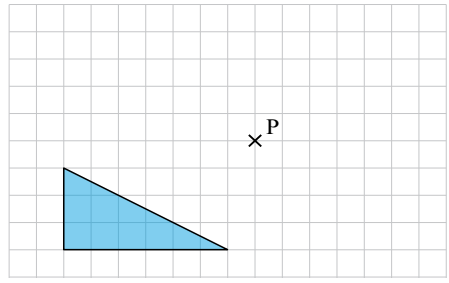
10 Copy the diagram. Show the new positions of the shape after anticlockwise rotations of 90° with these centres.

a P **b** Q



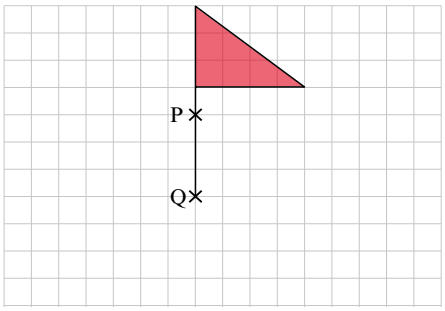
11 Copy the diagram and rotate the triangle through 180° with centre P.

Explain why it isn't necessary to give the direction of rotation.



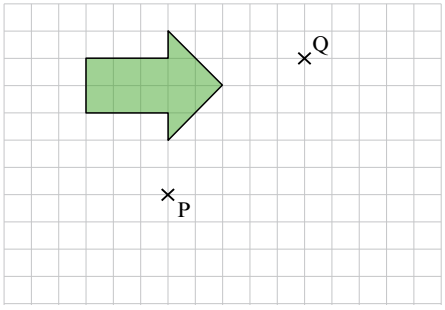
12 Copy the diagram. Show the new positions of the shape after clockwise rotations of 90° with these centres.

a P **b** Q



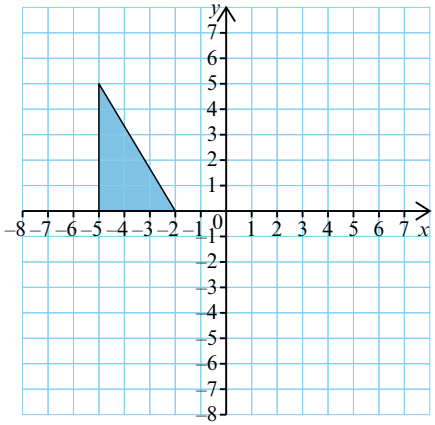
13 Copy the diagram. Show the new positions of the shape after anticlockwise rotations of 90° with these centres.

a P **b** Q

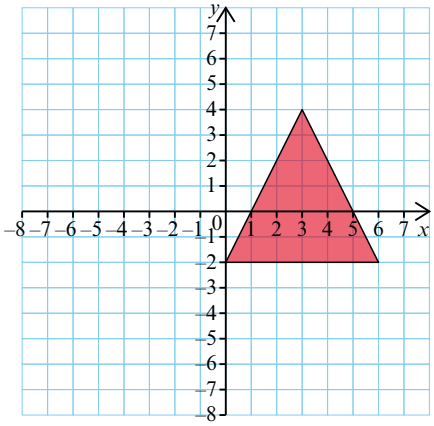


14 Copy each diagram. Rotate each shape 180° about the origin.

a

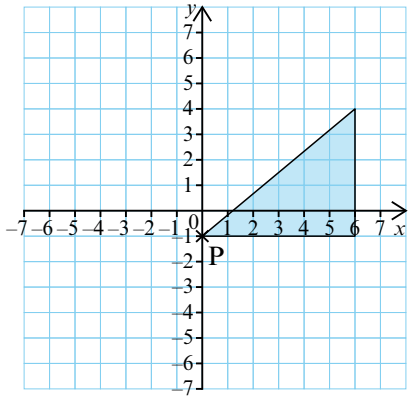


b

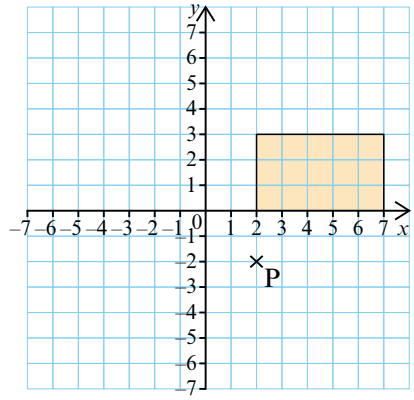


15 Copy each diagram. Rotate each shape 90° anticlockwise about point P. Label each image A.

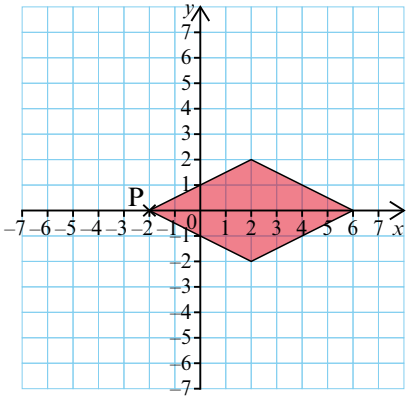
a



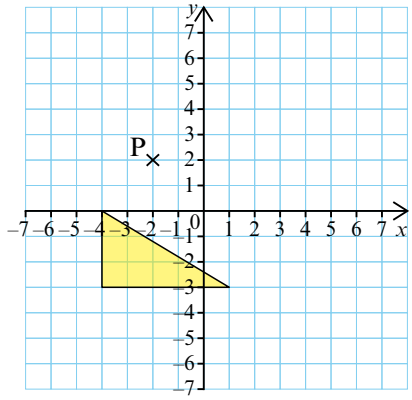
b



c



d

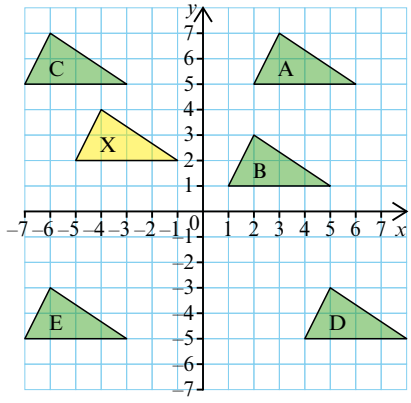


16 Look at your diagrams for question **15**. Rotate each of the original shapes 90° clockwise about the point shown. Label each image B.

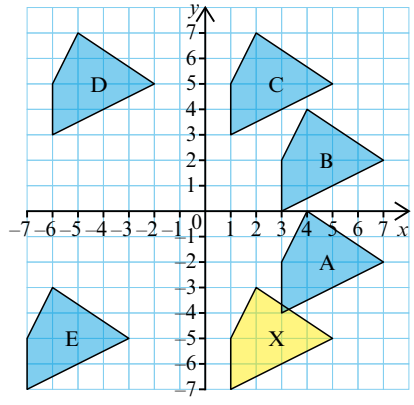
explanation 3a | explanation 3b | online

17 In these diagrams, X has been translated to each of the shapes A, B, C, D and E. Describe each translation in words or using a column vector.

a



b



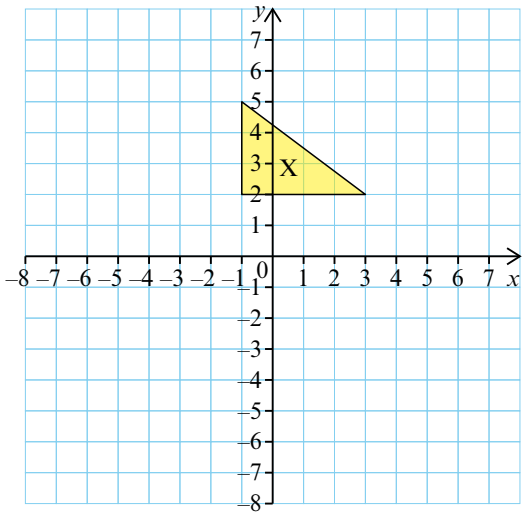
18 Follow the instructions to translate shape X. Label the images A, B, C and D.

a X → A right 4 units, up 3 units

b X → B left 6 units, down 10 units

c X → C left 5 units, up 2 units

d X → D right 2 units, down 7 units



***19** Follow the instructions to translate shape Y. Label the shapes E, F, G and H.

a Y → E $\begin{pmatrix}2\\4\end{pmatrix}$

b Y → F $\begin{pmatrix}-5\\2\end{pmatrix}$

c Y → G $\begin{pmatrix}2\\-6\end{pmatrix}$

d Y → H $\begin{pmatrix}-7\\-3\end{pmatrix}$