

# Reasoning and Problem Solving

## Step 3: Translations

### National Curriculum Objectives:

Mathematics Year 6: (6P2) [Draw and translate simple shapes on the coordinate plane, and reflect them in the axes](#)

Mathematics Year 6:(6P3) [Describe positions on the full coordinate grid \(all four quadrants\)](#)

### Differentiation:

Questions 1, 4 and 7 (Problem Solving)

**Developing** Identify quadrilaterals translated across up to two quadrants. One translation with one movement.

**Expected** Identify quadrilaterals translated across up to four quadrants. One translation with two movements per translation.

**Greater Depth** Children to create their own questions about the translation of irregular shapes across up to four quadrants.

Questions 2, 5 and 8 (Problem Solving)

**Developing** Identify coordinates of quadrilaterals translated across up to two quadrants. One movement per translation.

**Expected** Identify coordinates of common shapes translated across up to four quadrants.

**Greater Depth** Identify coordinates of irregular shapes translated across up to four quadrants.

Questions 3, 6 and 9 (Reasoning)

**Developing** Explain the position of quadrilaterals translated across up to two quadrants.

**Expected** Explain the position of a common shape translated across up to four quadrants.

**Greater Depth** Explain the position of an irregular shape translated across up to four quadrants.

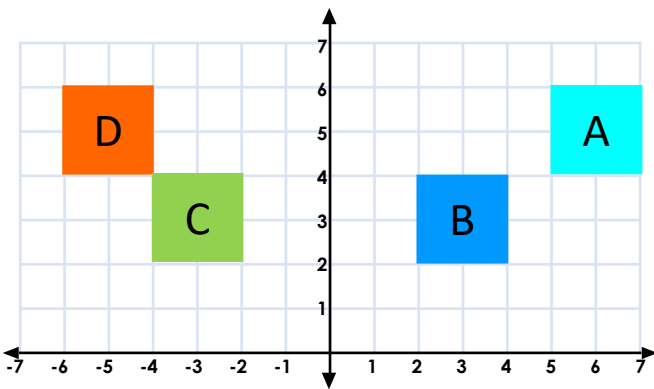
More [Year 6 Position and Direction](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

## Translations

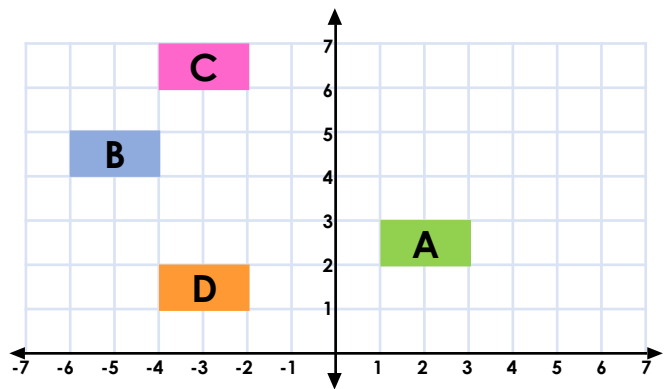
## Translations

1a. Which shape has been translated 6 squares to the left?



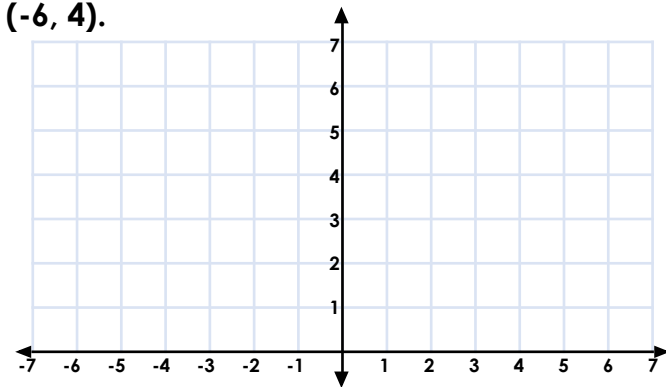
PS

1b. Which shape has been translated 5 squares down?



PS

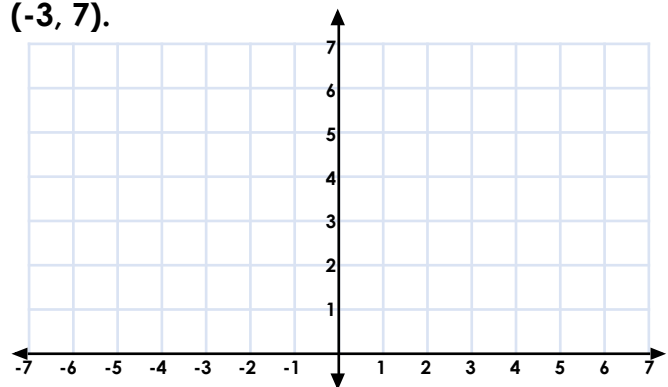
2a. Here are the coordinates of a rectangle: (2, 1), (3, 1), (2, 4), (3, 4).  
Two of the coordinates translate to (-5, 1), (-6, 4).



What are the other coordinates?

PS

2b. Here are the coordinates of a square: (-1, 2), (-3, 2), (-1, 4), (-3, 4).  
Two of the coordinates translate to (-1, 5), (-3, 7).

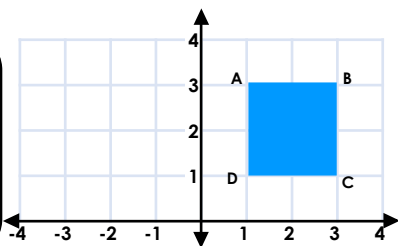


What are the other coordinates?

PS

3a. Anna draws shape ABCD on the grid. She wants to translate the shape so that point D becomes the coordinate (-4, 1). She says,

Point A will become the coordinate (3, -4).

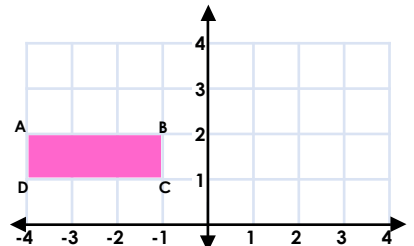


Do you agree? Explain why.

R

3b. Max draws shape ABCD on the grid. He wants to translate the shape so that point C becomes the coordinate (4, 1). He says,

Point D will become the coordinate (2, 4).



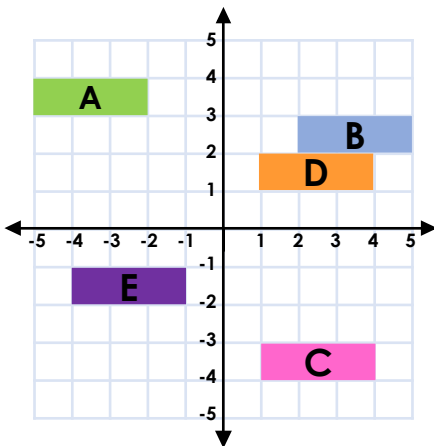
Do you agree? Explain why.

R

## Translations

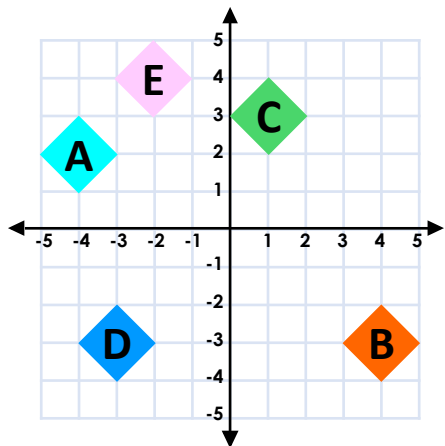
## Translations

4a. Which shape has been translated 5 squares to the right and 2 squares down?



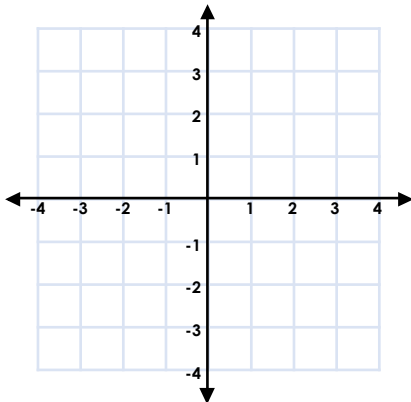
PS

4b. Which shape has been translated 3 squares to the right and 6 squares down?



PS

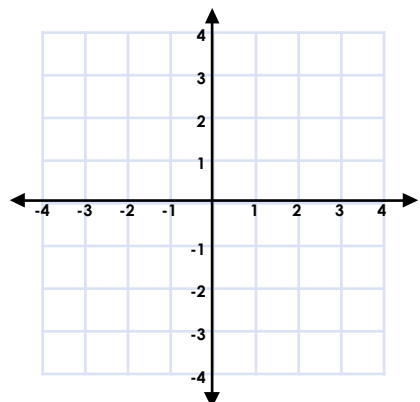
5a. Here are the coordinates of a triangle:  $(-1, 1)$ ,  $(-4, 1)$ ,  $(-4, 4)$ .  
The first coordinate translates to  $(4, -4)$ .



What are the other coordinates?

PS

5b. Here are the coordinates of a triangle:  $(1, 1)$ ,  $(1, 3)$ ,  $(2, 2)$ .  
The first coordinate translates to  $(-3, -4)$ .

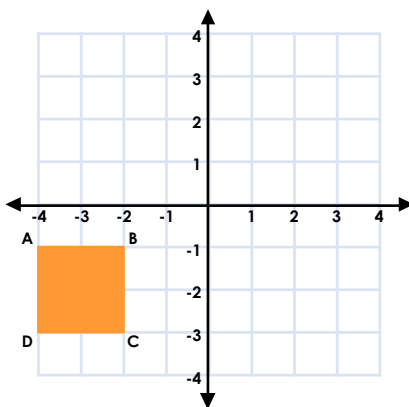


What are the other coordinates?

PS

6a. Daisy draws shape ABCD on the grid. She wants to translate the shape so that point B becomes the coordinate  $(0, 3)$ . She says,

Point A will become the coordinate  $(3, -2)$ .

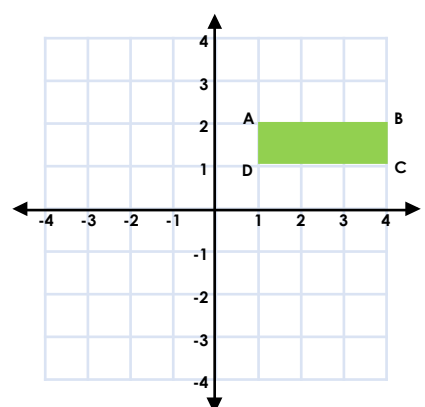


Do you agree? Explain why.

R

6b. Tom draws shape ABCD on the grid. He wants to translate the shape so that point A becomes the coordinate  $(-4, -1)$ . He says,

Point C will become the coordinate  $(-2, -1)$ .

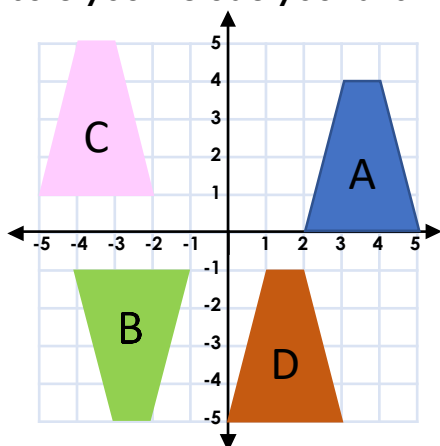


Do you agree? Explain why.

R

## Translations

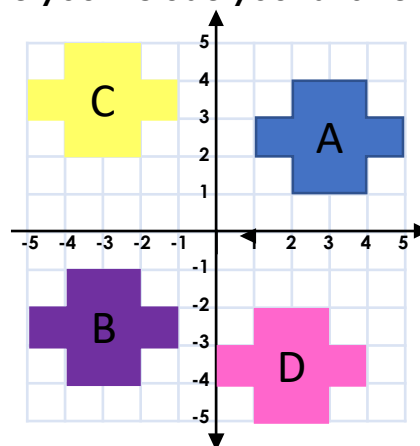
7a. Create three questions of your own about the translation of these shapes. Make sure you include your answers.



PS

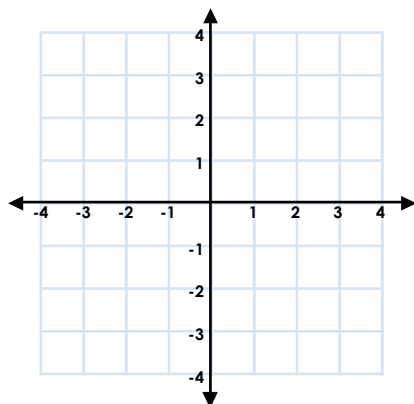
## Translations

7b. Create three questions of your own about the translation of these shapes. Make sure you include your answers.



PS

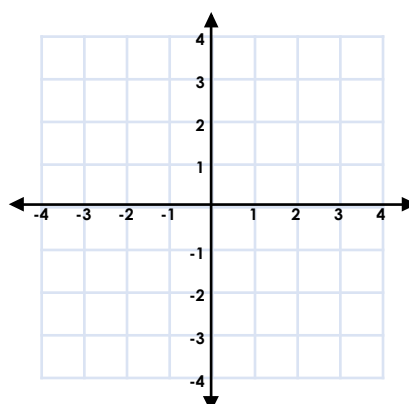
8a. Here are the coordinates of a shape: (1, 1), (1, 4), (3, 1), (3, 2), (2, 2), (2, 4). The first coordinate translates to (-3, -2).



What are the other coordinates?

PS

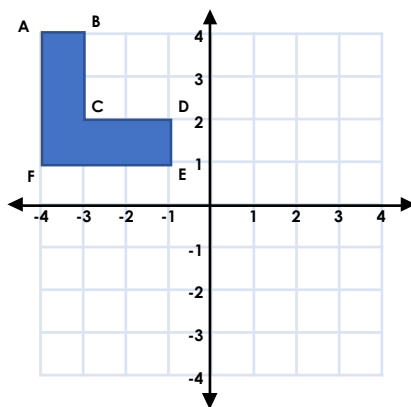
8b. Here are the coordinates of a shape: (-4, 0), (-3, 0), (-3, 2), (-2, 2), (-4, 4), (-3, 4). The first coordinate translates to (1, -2).



What are the other coordinates?

PS

9a. Justin draws shape ABCDEF on the grid. He wants to translate the shape so that point C becomes the coordinate (2, -2). He says,



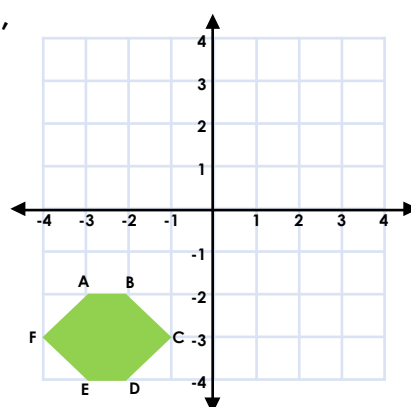
Point A will become the coordinate (2, 0).



Do you agree? Explain why.

R

9b. Freya draws shape ABCDEF on the grid. She wants to translate the shape so that point E becomes the coordinate (-1, 1). She says,



Point B will become the coordinate (3, 0).



Do you agree? Explain why.

R

## Reasoning and Problem Solving Translations

### Developing

- 1a. Shape B to C.  
2a.  $(-5, 4)$ ,  $(-6, 1)$ .  
3a. No, she is incorrect. Point A will become  $(-4, 3)$ . She has written the coordinates the wrong way round.

### Expected

- 4a. Shape E to C.  
5a.  $(1, -1)$ ,  $(1, -4)$ .  
6a. No, she is incorrect. Point A will become  $(-2, 3)$  after the translation. She has written the coordinates the wrong way round.

### Greater Depth

- 7a. Various answers, including; Which shape has been translated 5 squares to the left and 6 squares up? D to C. Which shape has been translated 1 squares down and 7 squares to the right? C to A.  
8a.  $(-3, 1)$ ,  $(-1, -2)$ ,  $(-1, -1)$ ,  $(-2, -1)$ ,  $(-2, 1)$   
9a. No, he is incorrect. Point A will translate to  $(1, 0)$ . He has written the coordinates for point B.

## Reasoning and Problem Solving Translations

### Developing

- 1b. Shape C to D.  
2b.  $(-1, 7)$ ,  $(-3, 5)$ .  
3b. No, he is incorrect. Point D will become  $(1, 1)$ . He has written the coordinates the wrong way round.

### Expected

- 4b. Shape E to B.  
5b.  $(-3, -2)$ ,  $(-1, -3)$ .  
6b. No, he is incorrect. Point C will become  $(-1, -2)$ . He has written the coordinates the wrong way round.

### Greater Depth

- 7b. Various answers, including; Which shape has been translated 6 squares to the left and 1 square up? D to B. Which shape has been translated 7 squares down and 5 squares to the right? C to D.  
8b.  $(2, -2)$ ,  $(2, 0)$ ,  $(3, 0)$ ,  $(1, 2)$ ,  $(2, 2)$   
9b. No, she is incorrect. Point B will translate to  $(0, 3)$ . She has written the coordinates the wrong way round.