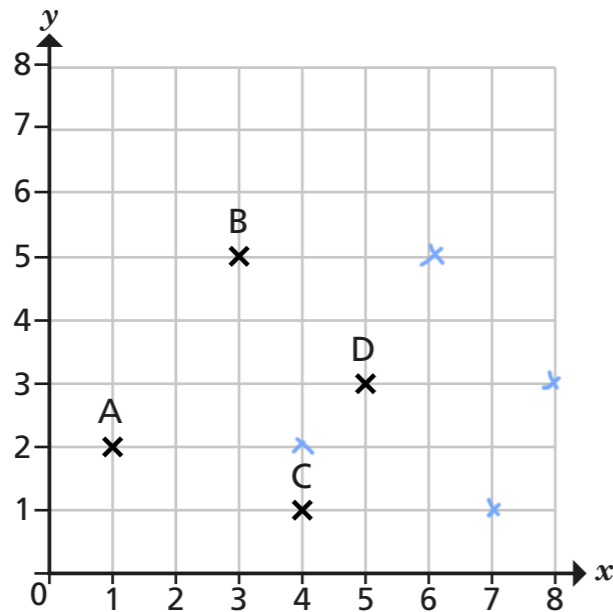


Translation with coordinates

1 Four points have been plotted on a coordinate grid.



- a) Translate each point 3 to the right.
b) Complete the table to show the coordinates of each point before and after the translation.

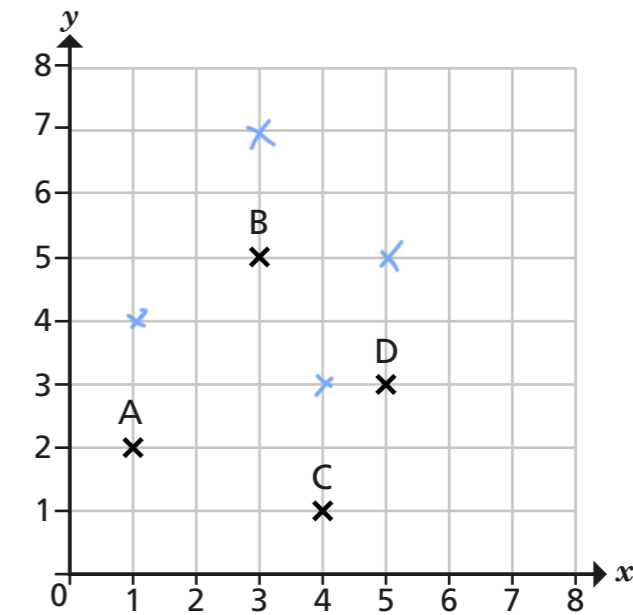
| Point | Coordinates before | Coordinates after |
|-------|--------------------|-------------------|
| A | (1, 2) | (4, 2) |
| B | (3, 5) | (6, 5) |
| C | (4, 1) | (7, 1) |
| D | (5, 3) | (8, 3) |

What do you notice?

- c) Which part of the coordinate stayed the same? y
d) Which part of the coordinate changed? x
e) Point E has the coordinates (12, 4). It is translated 3 to the right.

What are the coordinates of the translated point? (15 , 4)

2 Four points have been plotted on a coordinate grid.



- a) Translate each point 2 up.
b) Complete the table to show the coordinates of each point before and after the translation.

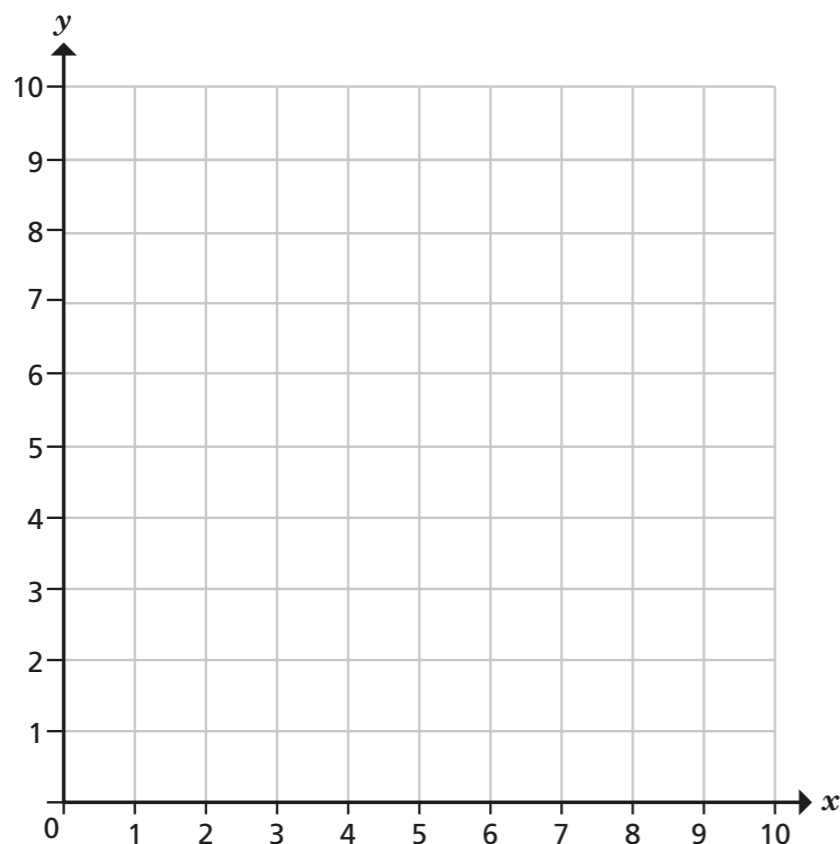
| Point | Coordinates before | Coordinates after |
|-------|--------------------|-------------------|
| A | (1, 2) | (1, 4) |
| B | (3, 5) | (3, 7) |
| C | (4, 1) | (4, 3) |
| D | (5, 3) | (5, 5) |

What do you notice?

- c) What has stayed the same in each coordinate? x
d) What has changed? y
e) Point E has the coordinates (12, 4).
It is translated 2 up.

What are the coordinates of the translated point? (12 , 6)

- 3 Write the coordinates of each point after the given translation.
You can use the coordinate grid to help you.



- a) $(2, 7)$ is translated 4 right and 3 down. $(\boxed{6}, \boxed{4})$
- b) $(9, 2)$ is translated 8 left and 5 up. $(\boxed{1}, \boxed{7})$
- c) $(10, 0)$ is translated 10 left. $(\boxed{0}, \boxed{0})$
- d) $(0, 4)$ is translated 6 right and 4 down. $(\boxed{6}, \boxed{0})$

Is it possible to work this out without drawing the points?

- 4 The coordinates of the vertices of a rectangle are $(18, 4)$, $(18, 7)$, $(23, 4)$ and $(23, 7)$.

The rectangle is translated 10 left and 2 down.

What are the coordinates of the vertices now?

$(\boxed{8}, \boxed{2})$ $(\boxed{8}, \boxed{5})$ $(\boxed{13}, \boxed{2})$ $(\boxed{13}, \boxed{5})$



- 5 Point M has the coordinates $(12, 19)$.
It is translated 21 right and 9 down.

Alex and Amir are working out the coordinates of the translated points. Here are their answers.

Alex $(3, 38)$ Amir $(33, 10)$

Who do you agree with?

Amir

Talk about it with a partner.

- 6 Point X has the coordinates $(17, 21)$.
After being translated, it now has the coordinates $(11, 35)$.
Describe the translation.

6 to the left and 14 up

- 7 A pentagon has been translated.

The table shows the coordinates of each vertex before and after the translation. Some of the information is missing.

| Before | After |
|---------------------------|--------------------|
| $(\boxed{2}, 7)$ | $(5, 13)$ |
| $(2, \boxed{14})$ | $(5, 20)$ |
| $(11, 7)$ | $(14, \boxed{13})$ |
| $(\boxed{11}, 14)$ | $(14, \boxed{20})$ |
| $(\boxed{7}, \boxed{19})$ | $(10, 25)$ |

a) Complete the table.

b) Describe the translation.

3 to the right and 6 up.

