

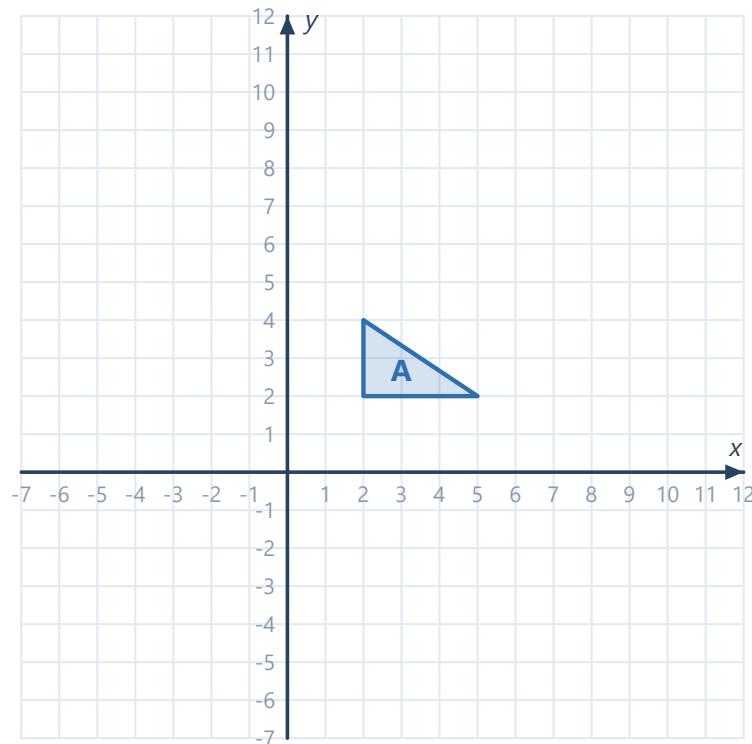
GCSE Maths: Reflection (Higher): answers

GCSE Maths - Transformations and Similarity - Higher - Lesson 21.1

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch21-transformations-congruence-similarity/higher/reflection/

Exercise 21A Reflection Non-calculator

- 1 Shape A has vertices at (2, 2), (5, 2), (2, 4). Reflect A in each mirror line and write down the coordinates of the vertices of the image.



- (a) the y-axis (the line $x = 0$)

Answer: B: (-2, 2), (-5, 2), (-2, 4)

- (b) the x-axis (the line $y = 0$)

Answer: B: (2, -2), (5, -2), (2, -4)

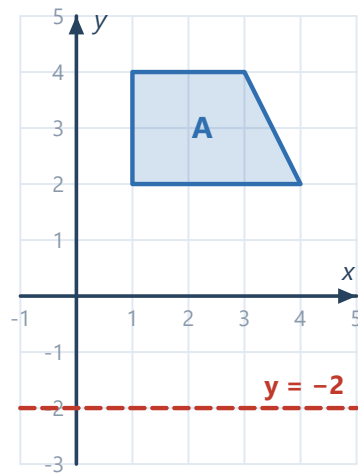
- (c) the line $x = 6$

Answer: B: (10, 2), (7, 2), (10, 4)

- (d) the line $y = 6$

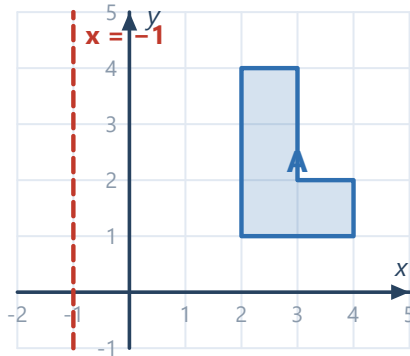
Answer: B: (2, 10), (5, 10), (2, 8)

- 2 Reflect shape A in the line $y = -2$. Write down the coordinates of the vertices of the image B. A has vertices at (1, 2), (4, 2), (3, 4), (1, 4).



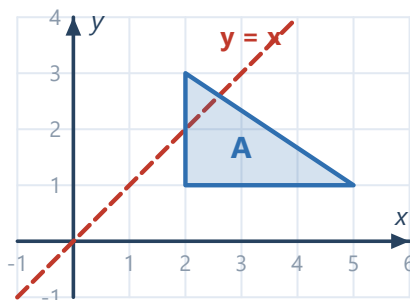
Answer: B: (1, -6), (4, -6), (3, -8), (1, -8)

- 3 Reflect shape A in the line $x = -1$. Write down the coordinates of the vertices of the image B. A has vertices at (2, 1), (4, 1), (4, 2), (3, 2), (3, 4), (2, 4).



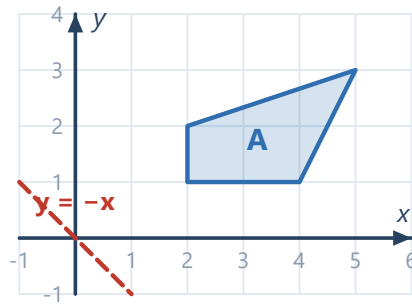
Answer: B: (-4, 1), (-6, 1), (-6, 2), (-5, 2), (-5, 4), (-4, 4)

- 4 Reflect shape A in the line $y = x$. Write down the coordinates of the vertices of the image B. A has vertices at (2, 1), (5, 1), (2, 3).



Answer: B: (1, 2), (1, 5), (3, 2)

- 5 Reflect shape A in the line $y = -x$. Write down the coordinates of the vertices of the image B. A has vertices at (2, 1), (4, 1), (5, 3), (2, 2).



Answer: B: $(-1, -2)$, $(-1, -4)$, $(-3, -5)$, $(-2, -2)$

6 Write down the image of the point $P(3, -2)$ when it is reflected in:

(a) the x-axis

Answer: $(3, 2)$

(b) the y-axis

Answer: $(-3, -2)$

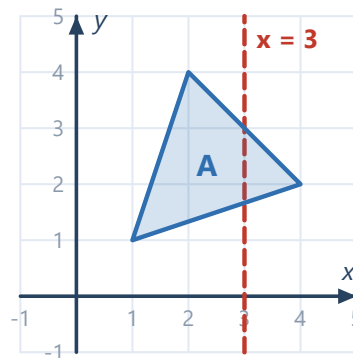
(c) the line $y = x$

Answer: $(-2, 3)$

(d) the line $y = -x$

Answer: $(2, -3)$

7 Triangle A is drawn on the grid and is crossed by the mirror line $x = 3$. Reflect A in the line $x = 3$ and write down the coordinates of the image. A has vertices at $(1, 1)$, $(4, 2)$, $(2, 4)$.

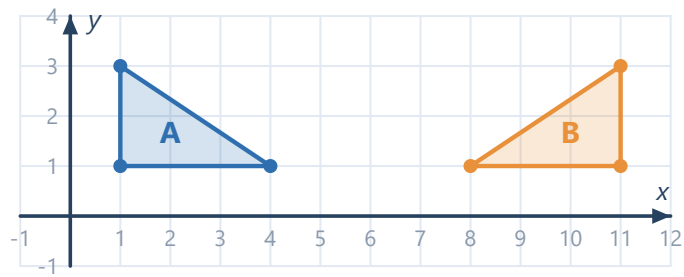


Answer: B: $(5, 1)$, $(2, 2)$, $(4, 4)$

8 Priya reflects triangle A, with vertices $(2, 1)$, $(5, 1)$, $(2, 3)$, in the line $y = x$. She writes the image as $(-1, -2)$, $(-1, -5)$, $(-3, -2)$. Explain her mistake and write down the correct image.

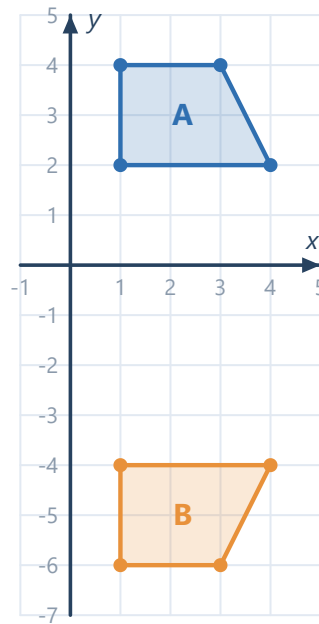
Answer: Priya reflected in $y = -x$. Correct image: $(1, 2)$, $(1, 5)$, $(3, 2)$

9 Describe fully the single transformation that maps shape A onto shape B.



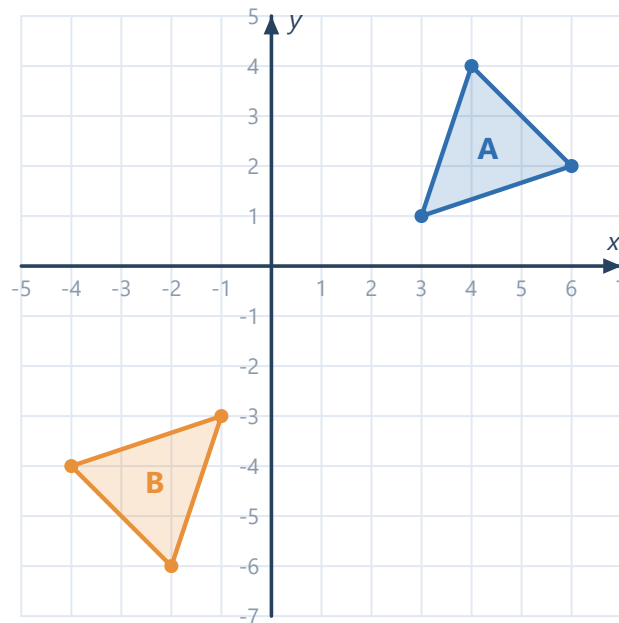
Answer: Reflection in the line $x = 6$

- 10** Describe fully the single transformation that maps shape A onto shape B.



Answer: Reflection in the line $y = -1$

- 11** Describe fully the single transformation that maps shape A onto shape B.



Answer: Reflection in the line $y = -x$

- 12** The point $P(4, 5)$ is reflected in a vertical line. Its image is $P'(10, 5)$. Work out the equation of the mirror line.

Answer: $x = 7$

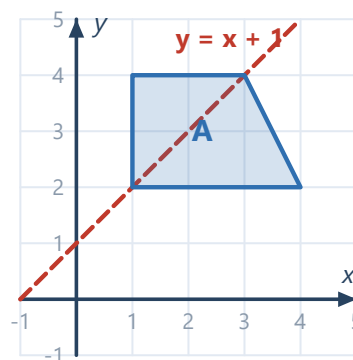
- 13** Shape A is reflected in the line $x = 3$ to give shape B. Shape B is then reflected in the line $x = 3$ to give shape C. Where is shape C? Explain.

Answer: C is in the same place as A

- 14** A shape has an area of 18 cm^2 . It is reflected in a line to give an image. What is the area of the image? Give a reason.

Answer: 18 cm^2

- 15** Reflect shape A in the line $y = x + 1$. Write down the coordinates of the image B. A has vertices at $(1, 2)$, $(4, 2)$, $(3, 4)$, $(1, 4)$.



Answer: B: $(1, 2)$, $(1, 5)$, $(3, 4)$, $(3, 2)$

- 16** Show that the reflection of the point (a, b) in the line $y = -x$ is the point $(-b, -a)$.

Answer: The midpoint of the two points is on $y = -x$ and the line joining them has gradient 1

