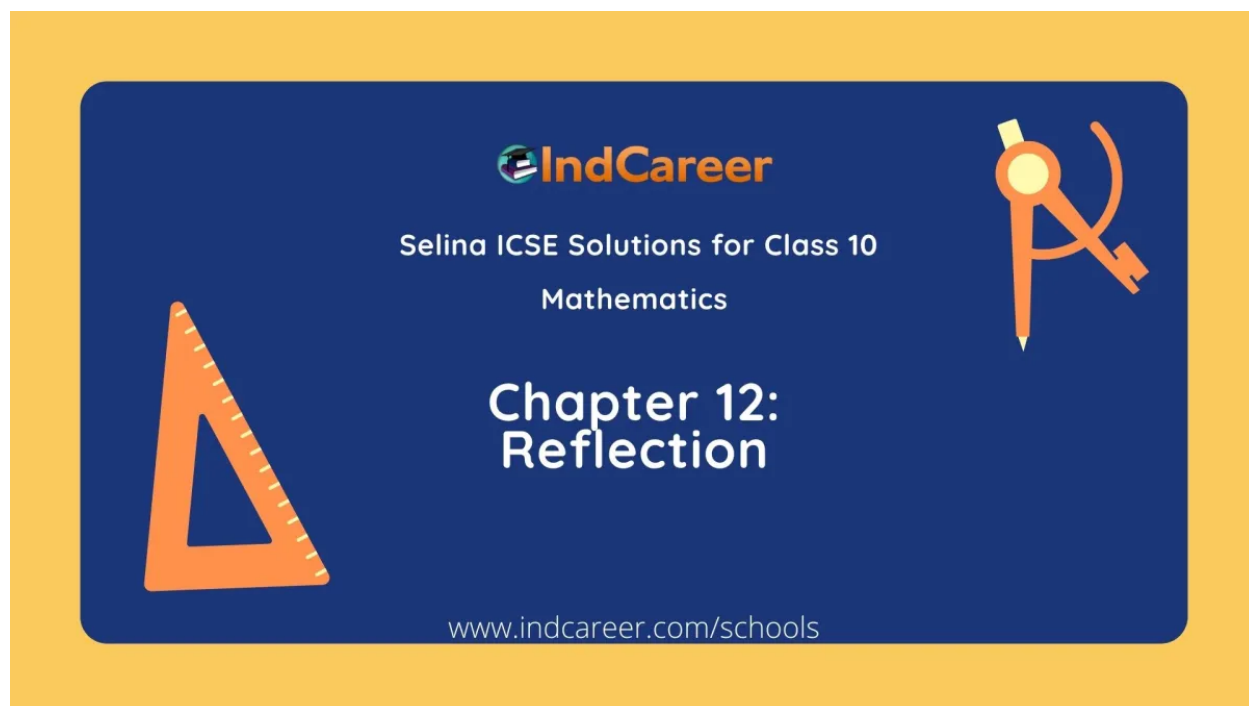


Selina Class 10 ICSE Solutions Mathematics :

Chapter 12- Reflection



For any clarifications or questions you can write to **info@indcareer.com**

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Selina Class 10 ICSE Solutions Mathematics :

Chapter 12- Reflection

Class 10: Maths Chapter 12 solutions. Complete Class 10 Maths Chapter 12 Notes.

Selina Class 10 ICSE Solutions Mathematics : Chapter 12- Reflection

Selina 10th Maths Chapter 12, Class 10 Maths Chapter 12 solutions

Exercise 12A

Question 1.

Complete the following table:

Point	Transformation	Image
(5, -7)		(-5, 7)
(4, 2)	Reflection in x-axis	
	Reflection in y-axis	(0, 6)
(6, -6)		(-6, 6)
(4, -8)		(-4, -8)

Solution:

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Point	Transformation	Image
(5, -7)	Reflection in origin	(-5, 7)
(4, 2)	Reflection in x-axis	(4, -2)
(0, 6)	Reflection in y-axis	(0, 6)
(6, -6)	Reflection in origin	(-6, 6)
(4, -8)	Reflection in y-axis	(-4, -8)

Question 2.

A point P is its own image under the reflection in a line l. Describe the position of point P with respect to the line l.

Solution:

Since, the point P is its own image under the reflection in the line l. So, point P is an invariant point.

Hence, the position of point P remains unaltered.

Question 3.

State the co-ordinates of the following points under reflection in x-axis:

(i) (3, 2)

(ii) (-5, 4)

(iii) (0, 0)

Solution:

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(i) (3, 2)

The co-ordinate of the given point under reflection in the x-axis is (3, -2).

(ii) (-5, 4)

The co-ordinate of the given point under reflection in the x-axis is (-5, -4).

(iii) (0, 0)

The co-ordinate of the given point under reflection in the x-axis is (0, 0).

Question 4.

State the co-ordinates of the following points under reflection in y-axis:

(i) (6, -3)

(ii) (-1, 0)

(iii) (-8, -2)

Solution:

(i) (6, -3)

The co-ordinate of the given point under reflection in the y-axis is (-6, -3).

(ii) (-1, 0)

The co-ordinate of the given point under reflection in the y-axis is (1, 0).

(iii) (-8, -2)

The co-ordinate of the given point under reflection in the y-axis is (8, -2).

Question 5.

State the co-ordinates of the following points under reflection in origin:

(i) (-2, -4)

(ii) (-2, 7)

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(iii) (0, 0)

Solution:

(i) (-2, -4)

The co-ordinate of the given point under reflection in origin is (2, 4).

(ii) (-2, 7)

The co-ordinate of the given point under reflection in origin is (2, -7).

(iii) (0, 0)

The co-ordinate of the given point under reflection in origin is (0, 0).

Question 6.

State the co-ordinates of the following points under reflection in the line $x = 0$:

(i) (-6, 4)

(ii) (0, 5)

(iii) (3, -4)

Solution:

(i) (-6, 4)

The co-ordinate of the given point under reflection in the line $x = 0$ is (6, 4).

(ii) (0, 5)

The co-ordinate of the given point under reflection in the line $x = 0$ is (0, 5).

(iii) (3, -4)

The co-ordinate of the given point under reflection in the line $x = 0$ is (-3, -4).

Question 7.

State the co-ordinates of the following points under reflection in the line $y = 0$:

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(i) $(-3, 0)$

(ii) $(8, -5)$

(iii) $(-1, -3)$

Solution:

(i) $(-3, 0)$

The co-ordinate of the given point under reflection in the line $y = 0$ is $(-3, 0)$.

(ii) $(8, -5)$

The co-ordinate of the given point under reflection in the line $y = 0$ is $(8, 5)$.

(iii) $(-1, -3)$

The co-ordinate of the given point under reflection in the line $y = 0$ is $(-1, 3)$.

Question 8.

A point P is reflected in the x-axis. Co-ordinates of its image are $(-4, 5)$.

(i) Find the co-ordinates of P.

(ii) Find the co-ordinates of the image of P under reflection in the y-axis.

Solution:

(i) Since, $M_x(-4, -5) = (-4, 5)$

So, the co-ordinates of P are $(-4, -5)$.

(ii) Co-ordinates of the image of P under reflection in the y-axis $(4, -5)$.

Question 9.

A point P is reflected in the origin. Co-ordinates of its image are $(-2, 7)$.

(i) Find the co-ordinates of P.

(ii) Find the co-ordinates of the image of P under reflection in the x-axis.

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Solution:

(i) Since, $M_O(2, -7) = (-2, 7)$

So, the co-ordinates of P are (2, -7).

(ii) Co-ordinates of the image of P under reflection in the x-axis (2, 7).

Question 10.

The point (a, b) is first reflected in the origin and then reflected in the y-axis to P'. If P' has co-ordinates (4, 6); evaluate a and b.

Solution:

$$M_O(a, b) = (-a, -b)$$

$$M_y(-a, -b) = (a, -b)$$

Thus, we get the co-ordinates of the point P' as (a, -b). It is given that the co-ordinates of P' are (4, 6).

On comparing the two points, we get, $a = 4$ and $b = -6$

Question 11.

The point P (x, y) is first reflected in the x-axis and reflected in the origin to P'. If P' has co-ordinates (-8, 5); evaluate x and y.

Solution:

$$M_x(x, y) = (x, -y)$$

$$M_O(x, -y) = (-x, y)$$

Thus, we get the co-ordinates of the point P' as (-x, y). It is given that the co-ordinates of P' are (-8, 5).

On comparing the two points, we get, $x = 8$ and $y = 5$

Question 12.

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The point A (-3, 2) is reflected in the x-axis to the point A'. Point A' is then reflected in the origin to point A''.

(i) Write down the co-ordinates of A''.

(ii) Write down a single transformation that maps A onto A''.

Solution:

(i) The reflection in x-axis is given by $M_x (x, y) = (x, -y)$.

A' = reflection of A (-3, 2) in the x- axis = (-3, -2).

The reflection in origin is given by $M_o (x, y) = (-x, -y)$.

A'' = reflection of A' (-3, -2) in the origin = (3, 2)

(ii) The reflection in y-axis is given by $M_y (x, y) = (-x, y)$.

The reflection of A (-3, 2) in y-axis is (3, 2).

Thus, the required single transformation is the reflection of A in the y-axis to the point A''.

Question 13.

The point A (4, 6) is first reflected in the origin to point A'. Point A' is then reflected in the y-axis to the point A''.

(i) Write down the co-ordinates of A''.

(ii) Write down a single transformation that maps A onto A''.

Solution:

(i) The reflection in origin is given by $M_o (x, y) = (-x, -y)$.

A' = reflection of A (4, 6) in the origin = (-4, -6)

The reflection in y-axis is given by $M_y (x, y) = (-x, y)$.

A'' = reflection of A' (-4, -6) in the y-axis = (4, -6)

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(ii) The reflection in x-axis is given by $M_x (x, y) = (x, -y)$.

The reflection of A (4, 6) in x-axis is (4, -6).

Thus, the required single transformation is the reflection of A in the x-axis to the point A''.

Question 14.

The triangle ABC, where A is (2, 6), B is (-3, 5) and C is (4, 7), is reflected in the y-axis to triangle A'B'C'. Triangle A'B'C' is then reflected in the origin to triangle A''B''C''.

(i) Write down the co-ordinates of A'', B'' and C''.

(ii) Write down a single transformation that maps triangle ABC onto triangle A''B''C''.

Solution:

(i) Reflection in y-axis is given by $M_y (x, y) = (-x, y)$

$\therefore$ A' = Reflection of A (2, 6) in y-axis = (-2, 6)

Similarly, B' = (3, 5) and C' = (-4, 7)

Reflection in origin is given by $M_o (x, y) = (-x, -y)$

$\therefore$ A'' = Reflection of A' (-2, 6) in origin = (2, -6)

Similarly, B'' = (-3, -5) and C'' = (4, -7)

(ii) A single transformation which maps triangle ABC to triangle A''B''C'' is reflection in x-axis.

Question 15.

P and Q have co-ordinates (-2, 3) and (5, 4) respectively. Reflect P in the x-axis to P' and Q in the y-axis to Q'. State the co-ordinates of P' and Q'.

Solution:

Reflection in x-axis is given by $M_x (x, y) = (x, -y)$

P' = Reflection of P(-2, 3) in x-axis = (-2, -3)

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Reflection in y-axis is given by $M_y(x, y) = (-x, y)$

$Q' =$ Reflection of $Q(5, 4)$ in y-axis $= (-5, 4)$

Thus, the co-ordinates of points P' and Q' are $(-2, -3)$ and $(-5, 4)$ respectively.

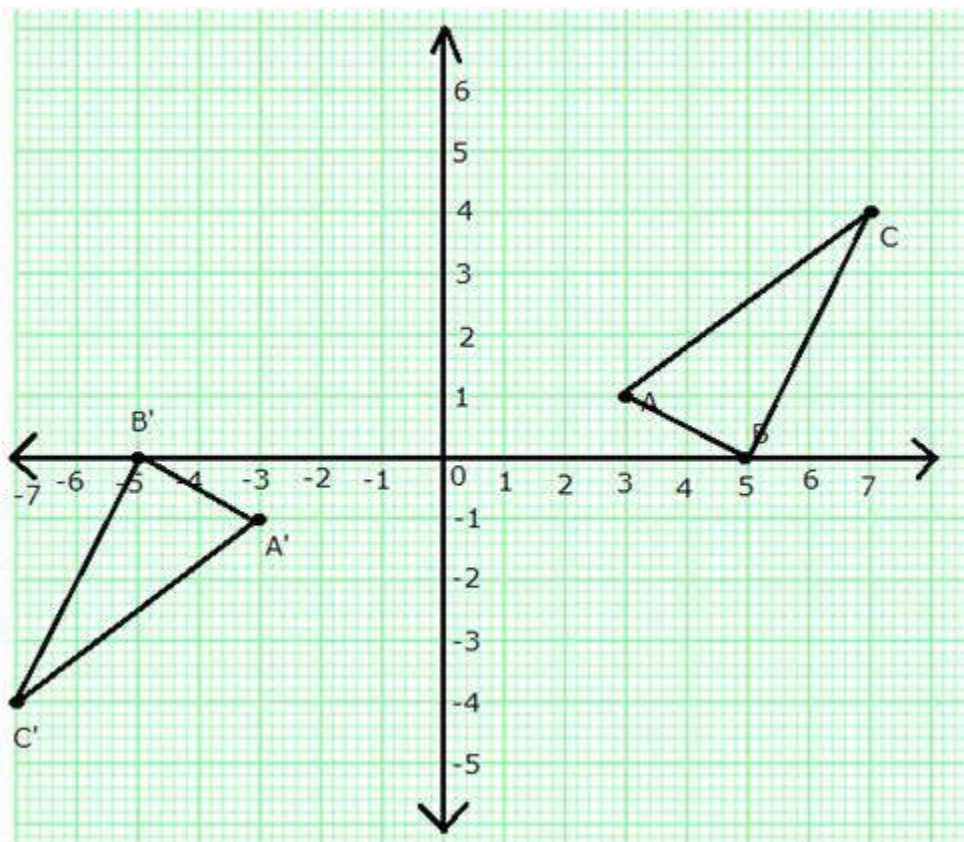
Question 16.

On a graph paper, plot the triangle ABC, whose vertices are at points A (3, 1), B (5, 0) and C (7, 4).

On the same diagram, draw the image of the triangle ABC under reflection in the origin O (0, 0).

Solution:

The graph shows triangle ABC and triangle A'B'C' which is obtained when ABC is reflected in the origin.



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Question 17.

Find the image of point (4, -6) under the following operations:

(i) $M_x \cdot M_y$ (ii) $M_y \cdot M_x$

(iii) $M_O \cdot M_x$ (iv) $M_x \cdot M_O$

(v) $M_O \cdot M_y$ (vi) $M_y \cdot M_O$

Write down a single transformation equivalent to each operation given above. State whether:

(a) $M_O \cdot M_x = M_x \cdot M_O$

(b) $M_y \cdot M_O = M_O \cdot M_y$

Solution:

(i) $M_x \cdot M_y (4, -6) = M_x (-4, -6) = (-4, 6)$

Single transformation equivalent to $M_x \cdot M_y$ is M_O .

(ii) $M_y \cdot M_x (4, -6) = M_y (4, 6) = (-4, 6)$

Single transformation equivalent to $M_y \cdot M_x$ is M_O .

(iii) $M_O \cdot M_x (4, -6) = M_O (4, 6) = (-4, -6)$

Single transformation equivalent to $M_O \cdot M_x$ is M_y .

(iv) $M_x \cdot M_O (4, -6) = M_x (-4, 6) = (-4, -6)$

Single transformation equivalent to $M_x \cdot M_O$ is M_y .

(v) $M_O \cdot M_y (4, -6) = M_O (-4, -6) = (4, 6)$

Single transformation equivalent to $M_O \cdot M_y$ is M_x .

(vi) $M_y \cdot M_O (4, -6) = M_y (-4, 6) = (4, 6)$

Single transformation equivalent to $M_x \cdot M_O$ is M_x .

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From (iii) and (iv), it is clear that $M_O \cdot M_x = M_x \cdot M_O$.

From (v) and (vi), it is clear that $M_y \cdot M_O = M_O \cdot M_y$.

Question 18.

Point A (4, -1) is reflected as A' in the y-axis. Point B on reflection in the x-axis is mapped as B' (-2, 5). Write down the co-ordinates of A' and B.

Solution:

Reflection in y-axis is given by $M_y (x, y) = (-x, y)$

A' = Reflection of A(4, -1) in y-axis = (-4, -1)

Reflection in x-axis is given by $M_x (x, y) = (x, -y)$

B' = Reflection of B in x-axis = (-2, 5)

Thus, B = (-2, -5)

Question 19.

The point (-5, 0) on reflection in a line is mapped as (5, 0) and the point (-2, -6) on reflection in the same line is mapped as (2, -6).

(a) Name the line of reflection.

(b) Write down the co-ordinates of the image of (5, -8) in the line obtained in (a).

Solution:

(a) We know that reflection in the line $x = 0$ is the reflection in the y-axis.

It is given that:

Point (-5, 0) on reflection in a line is mapped as (5, 0).

Point (-2, -6) on reflection in the same line is mapped as (2, -6).

Hence, the line of reflection is $x = 0$.

(b) It is known that $M_y (x, y) = (-x, y)$

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Co-ordinates of the image of (5, -8) in the line $x = 0$ are (-5, -8).

Exercise 12B

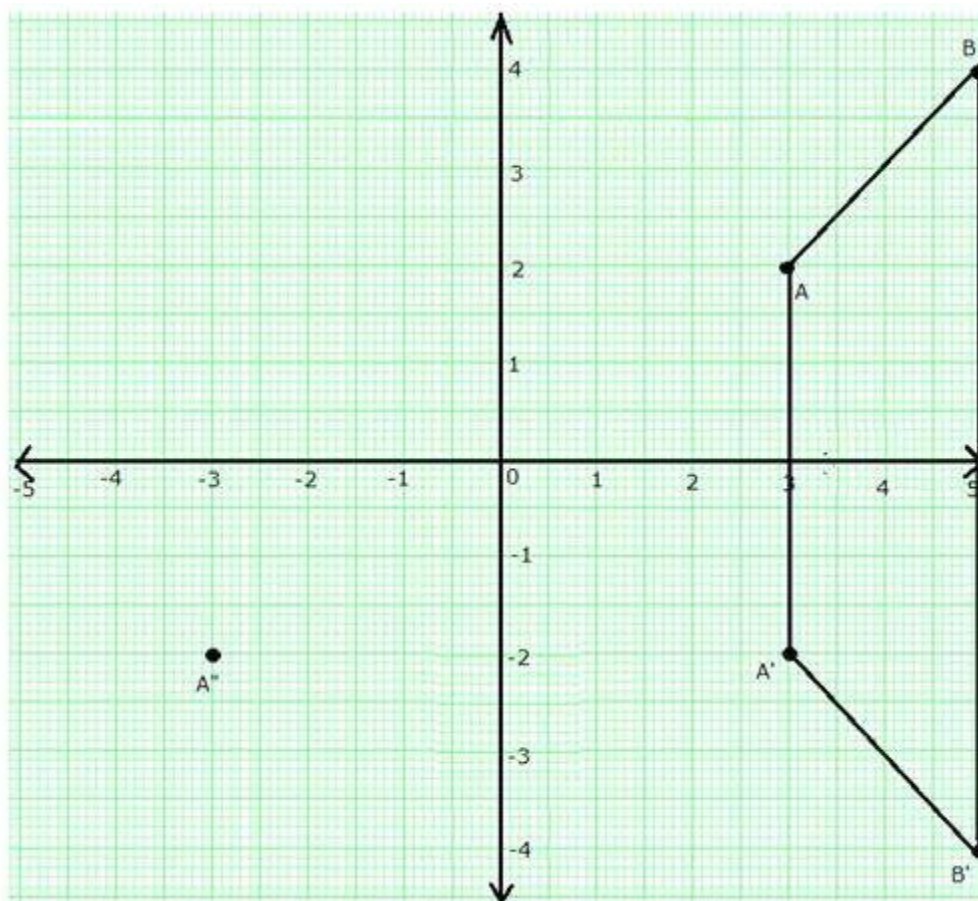
Question 1.

Attempt this question on graph paper.

- (a) Plot A (3, 2) and B (5, 4) on graph paper. Take 2 cm = 1 unit on both the axes.
- (b) Reflect A and B in the x-axis to A' and B' respectively. Plot these points also on the same graph paper.
- (c) Write down:
 - (i) the geometrical name of the figure ABB'A';
 - (ii) the measure of angle ABB';
 - (iii) the image of A'' of A, when A is reflected in the origin.
 - (iv) the single transformation that maps A' to A''.

Solution:

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(c)

(i) From graph, it is clear that $ABB'A'$ is an isosceles trapezium.

(ii) The measure of angle ABB' is 45° .

(iii) $A'' = (-3, -2)$

(iv) Single transformation that maps A' to A'' is the reflection in y-axis.

Question 2.

Points $(3, 0)$ and $(-1, 0)$ are invariant points under reflection in the line L_1 ; points $(0, -3)$ and $(0, 1)$ are invariant points on reflection in line L_2 .

(i) Name or write equations for the lines L_1 and L_2 .

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(ii) Write down the images of the points P (3, 4) and Q (-5, -2) on reflection in line L_1 . Name the images as P' and Q' respectively.

(iii) Write down the images of P and Q on reflection in L_2 . Name the images as P'' and Q'' respectively.

(iv) State or describe a single transformation that maps P' onto P''.

Solution:

(i) We know that every point in a line is invariant under the reflection in the same line.

Since points (3, 0) and (-1, 0) lie on the x-axis.

So, (3, 0) and (-1, 0) are invariant under reflection in x-axis.

Hence, the equation of line L_1 is $y = 0$.

Similarly, (0, -3) and (0, 1) are invariant under reflection in y-axis.

Hence, the equation of line L_2 is $x = 0$.

(ii) P' = Image of P (3, 4) in $L_1 = (3, -4)$

Q' = Image of Q (-5, -2) in $L_1 = (-5, 2)$

(iii) P'' = Image of P (3, 4) in $L_2 = (-3, 4)$

Q'' = Image of Q (-5, -2) in $L_2 = (5, -2)$

(iv) Single transformation that maps P' onto P'' is reflection in origin.

Question 3.

(i) Point P (a, b) is reflected in the x-axis to P' (5, -2). Write down the values of a and b.

(ii) P'' is the image of P when reflected in the y-axis. Write down the co-ordinates of P''.

(iii) Name a single transformation that maps P' to P''.

Solution:

(i) We know $M_x(x, y) = (x, -y)$

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$P' (5, -2)$ = reflection of $P (a, b)$ in x -axis.

Thus, the co-ordinates of P are $(5, 2)$.

Hence, $a = 5$ and $b = 2$.

(ii) P'' = image of $P (5, 2)$ reflected in y -axis = $(-5, 2)$

(iii) Single transformation that maps P' to P'' is the reflection in origin.

Question 4.

The point $(-2, 0)$ on reflection in a line is mapped to $(2, 0)$ and the point $(5, -6)$ on reflection in the same line is mapped to $(-5, -6)$.

(i) State the name of the mirror line and write its equation.

(ii) State the co-ordinates of the image of $(-8, -5)$ in the mirror line.

Solution:

(i) We know reflection of a point (x, y) in y -axis is $(-x, y)$.

Hence, the point $(-2, 0)$ when reflected in y -axis is mapped to $(2, 0)$.

Thus, the mirror line is the y -axis and its equation is $x = 0$.

(ii) Co-ordinates of the image of $(-8, -5)$ in the mirror line (i.e., y -axis) are $(8, -5)$.

Question 5.

The points $P (4, 1)$ and $Q (-2, 4)$ are reflected in line $y = 3$. Find the co-ordinates of P' , the image of P and Q' , the image of Q .

Solution:

The line $y = 3$ is a line parallel to x -axis and at a distance of 3 units from it.

Mark points $P (4, 1)$ and $Q (-2, 4)$.

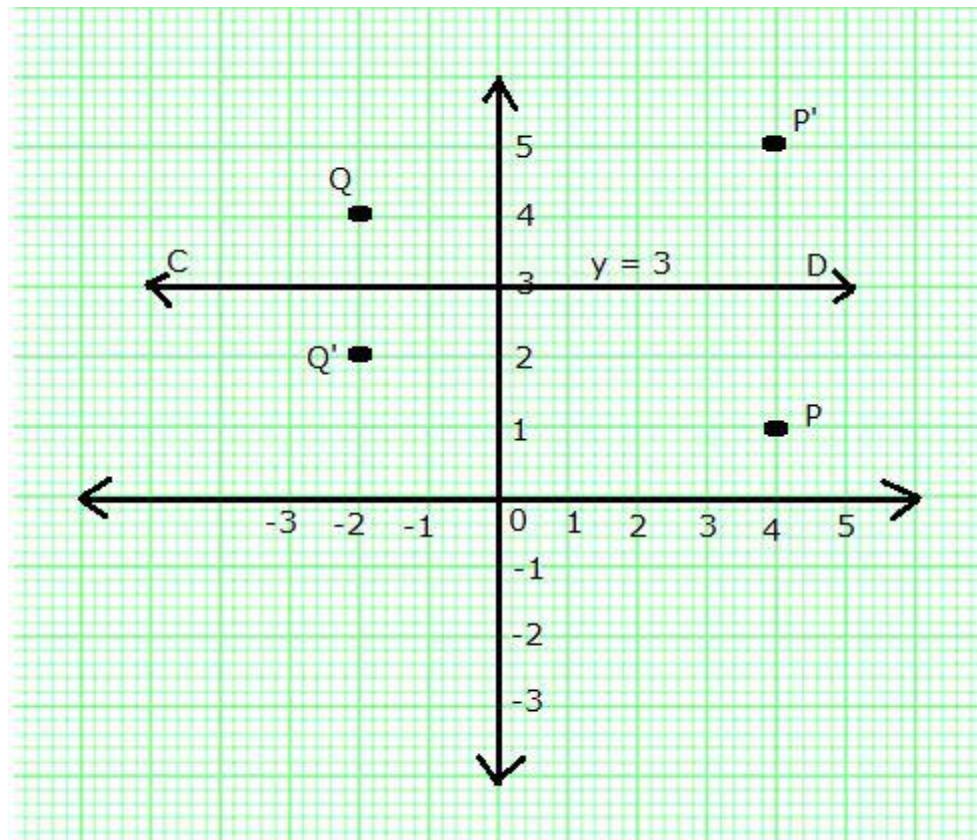
From P , draw a straight line perpendicular to line CD and produce. On this line mark a point P' which is at the same distance above CD as P is below it.

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The co-ordinates of P' are $(4, 5)$.

Similarly, from Q , draw a line perpendicular to CD and mark point Q' which is at the same distance below CD as Q is above it.

The co-ordinates of Q' are $(-2, 2)$.



Question 6.

A point $P(-2, 3)$ is reflected in line $x = 2$ to point P' . Find the coordinates of P' .

Solution:

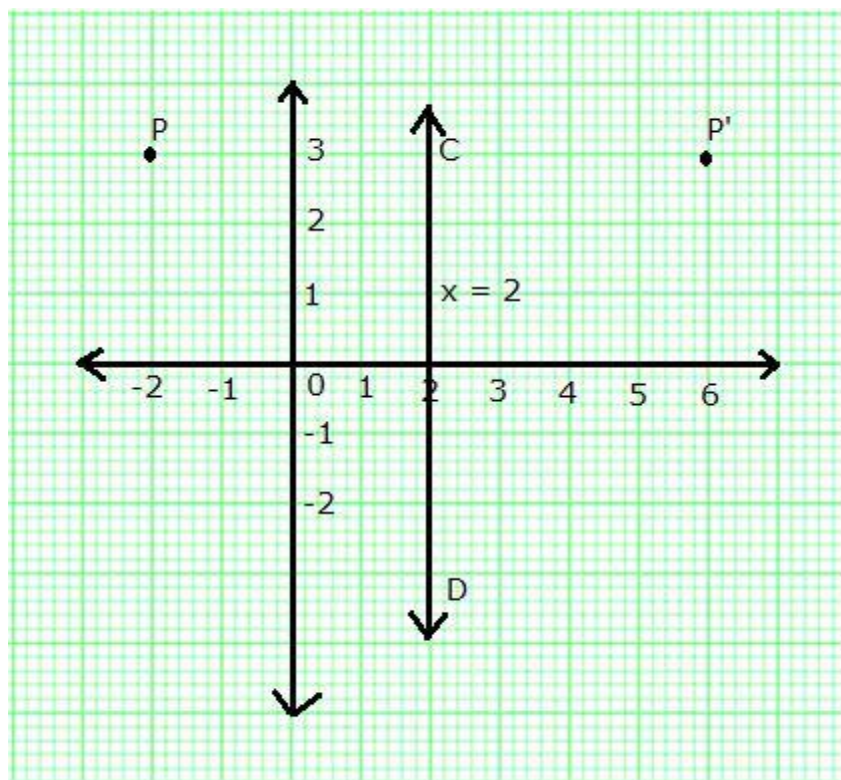
The line $x = 2$ is a line parallel to y -axis and at a distance of 2 units from it.

Mark point $P(-2, 3)$.

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From P, draw a straight line perpendicular to line CD and produce. On this line mark a point P' which is at the same distance to the right of CD as P is to the left of it.

The co-ordinates of P' are (6, 3).

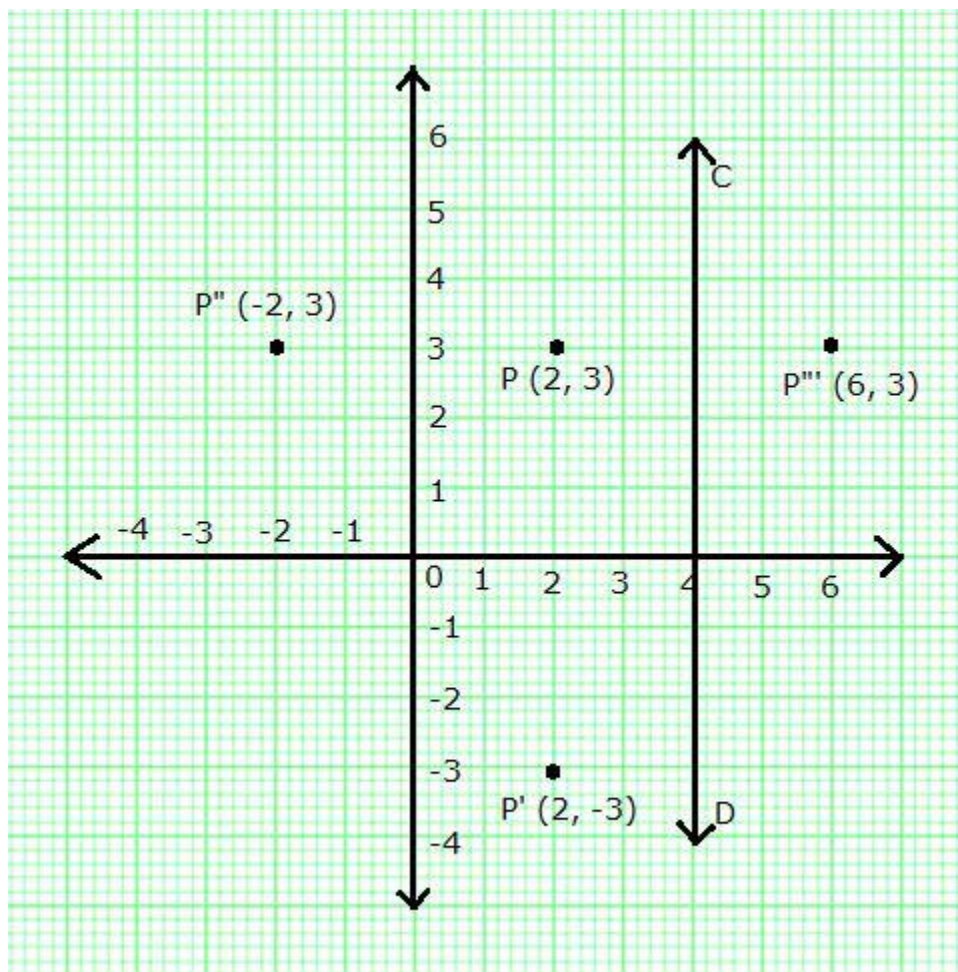


Question 7.

A point P (a, b) is reflected in the x-axis to P' (2, -3). Write down the values of a and b. P'' is the image of P, reflected in the y-axis. Write down the co-ordinates of P''. Find the co-ordinates of P''', when P is reflected in the line, parallel to y-axis, such that $x = 4$.

Solution:

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A point $P(a, b)$ is reflected in the x -axis to $P'(2, -3)$.

We know $M_x(x, y) = (x, -y)$

Thus, co-ordinates of P are $(2, 3)$. Hence, $a = 2$ and $b = 3$.

P'' = Image of P reflected in the y -axis = $(-2, 3)$

P''' = Reflection of P in the line $(x = 4) = (6, 3)$

Question 8.

Points A and B have co-ordinates $(3, 4)$ and $(0, 2)$ respectively. Find the image:

(a) A' of A under reflection in the x -axis.

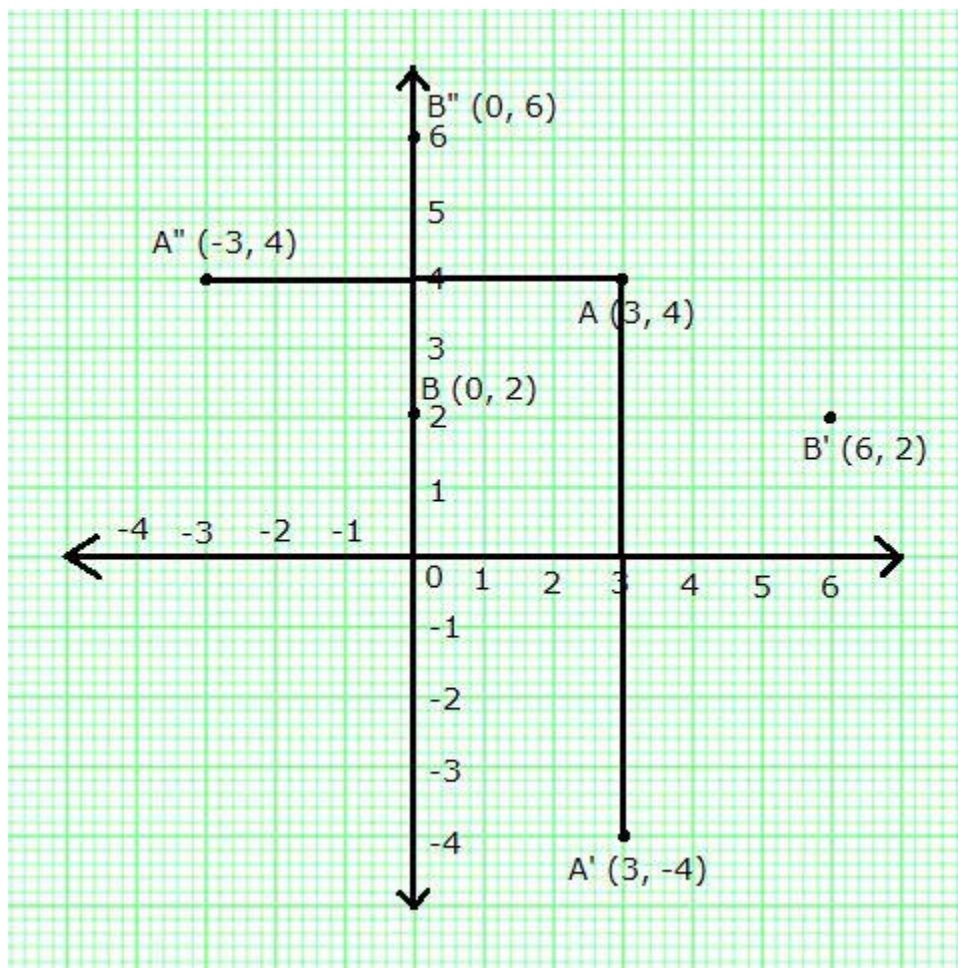
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(b) B' of B under reflection in the line AA' .

(c) A'' of A under reflection in the y -axis.

(d) B'' of B under reflection in the line AA'' .

Solution:



(a) $A' =$ Image of A under reflection in the x -axis $= (3, -4)$

(b) $B' =$ Image of B under reflection in the line $AA' = (6, 2)$

(c) $A'' =$ Image of A under reflection in the y -axis $= (-3, 4)$

(d) $B'' =$ Image of B under reflection in the line $AA'' = (0, 6)$

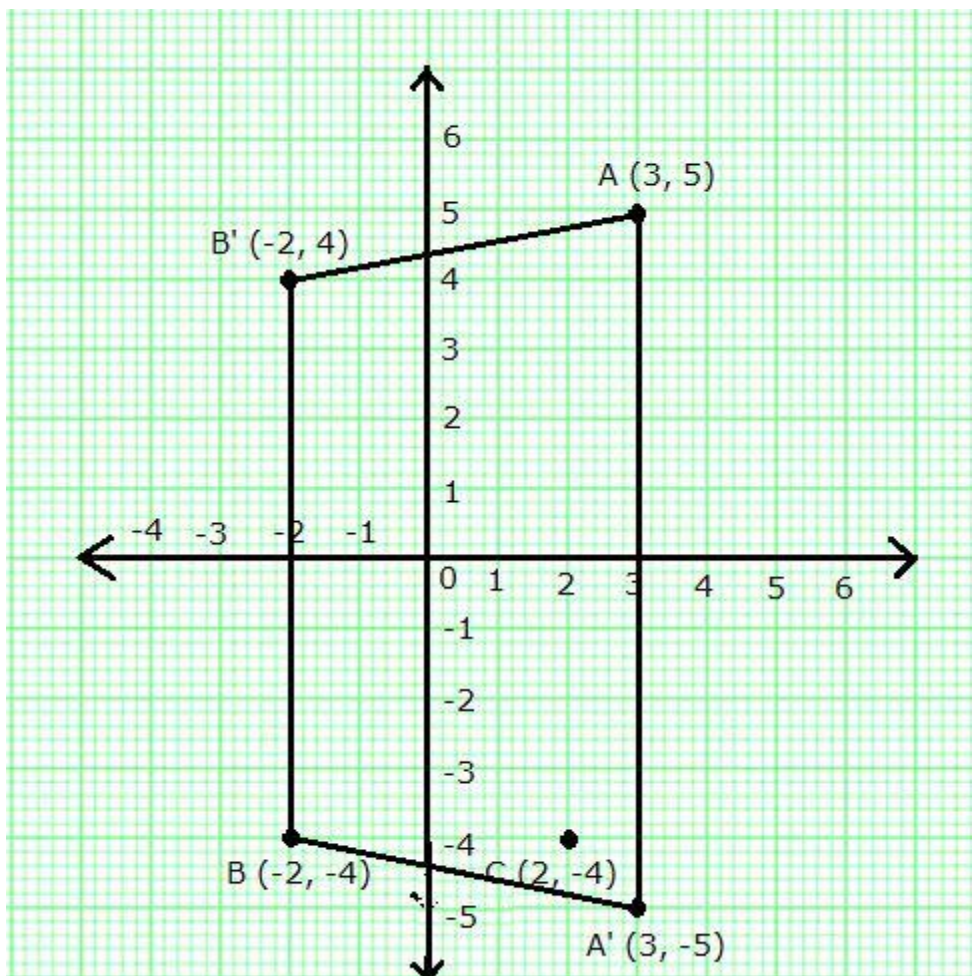
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Question 9.

- (i) Plot the points A (3, 5) and B (-2, -4). Use 1 cm = 1 unit on both the axes.**
- (ii) A' is the image of A when reflected in the x-axis. Write down the co-ordinates of A' and plot it on the graph paper.**
- (iii) B' is the image of B when reflected in the y-axis, followed by reflection in the origin. Write down the co-ordinates of B' and plot it on the graph paper.**
- (iv) Write down the geometrical name of the figure AA'BB'.**
- (v) Name the invariant points under reflection in the x-axis.**

Solution:

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(i) The points A (3, 5) and B (-2, -4) can be plotted on a graph as shown.

(ii) $A' = \text{Image of A when reflected in the x-axis} = (3, -5)$

(iii) $C = \text{Image of B when reflected in the y-axis} = (2, -4)$

$B' = \text{Image when C is reflected in the origin} = (-2, 4)$

(iv) Isosceles trapezium

(v) Any point that remains unaltered under a given transformation is called an invariant.

Thus, the required two points are (3, 0) and (-2, 0).

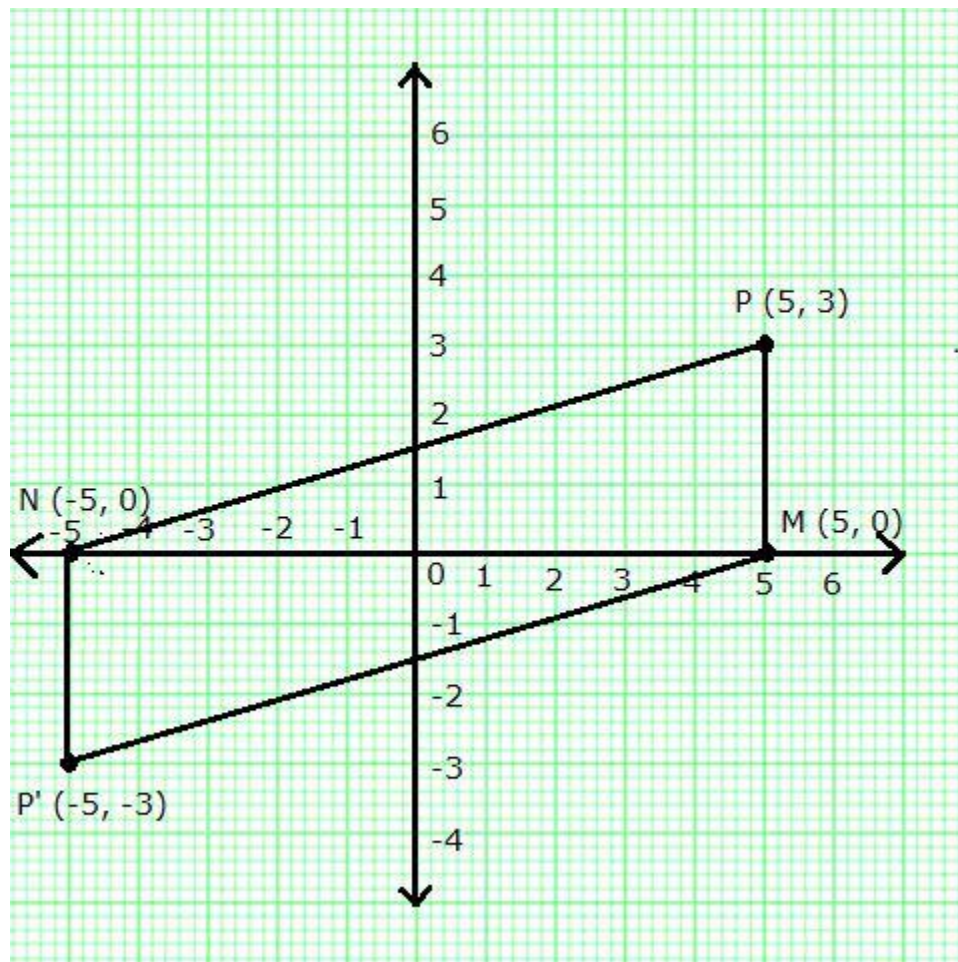
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Question 10.

The point $P (5, 3)$ was reflected in the origin to get the image P' .

- (a) Write down the co-ordinates of P' .
- (b) If M is the foot of the perpendicular from P to the x -axis, find the co-ordinates of M .
- (c) If N is the foot of the perpendicular from P' to the x -axis, find the co-ordinates of N .
- (d) Name the figure $PMP'N$.
- (e) Find the area of the figure $PMP'N$.

Solution:



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- (a) Co-ordinates of $P' = (-5, -3)$
- (b) Co-ordinates of $M = (5, 0)$
- (c) Co-ordinates of $N = (-5, 0)$
- (d) $PMP'N$ is a parallelogram.
- (e) Area of $PMP'N = 2$ (Area of ΔPMN)

$$= 2 \times \frac{1}{2} \times 10 \times 3$$

$$= 30 \text{ sq. units}$$

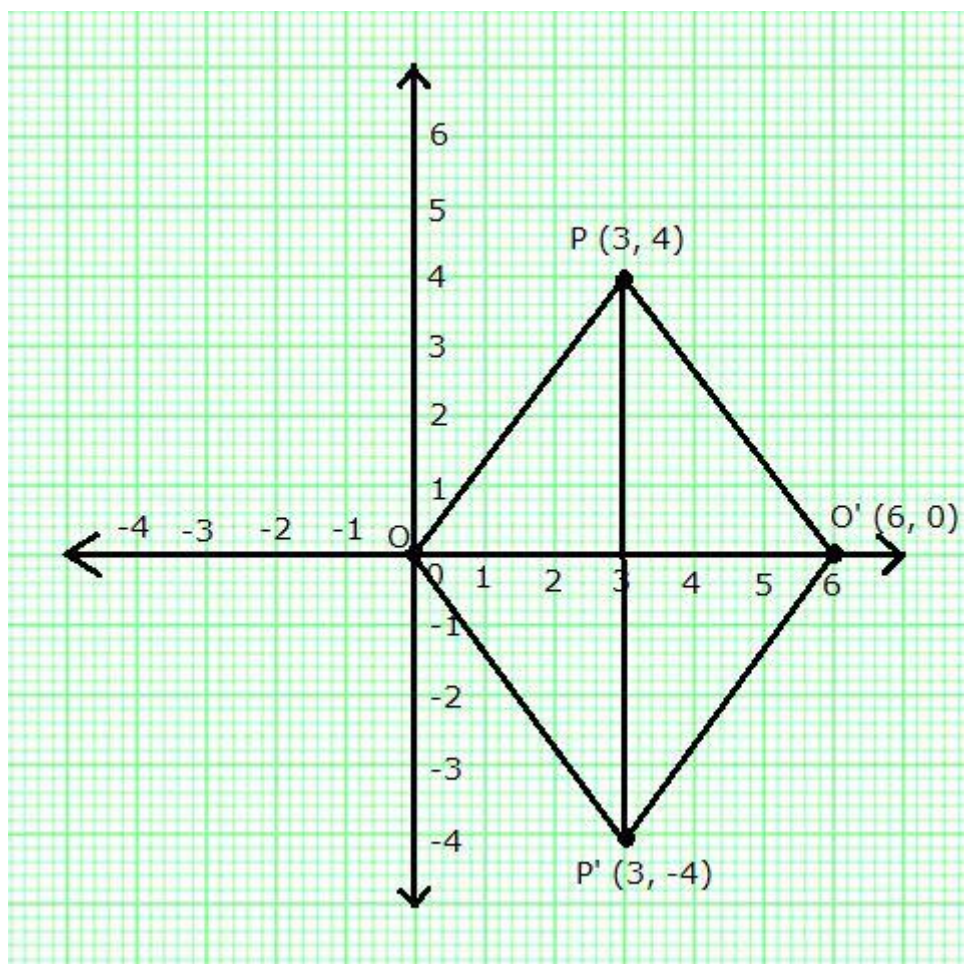
Question 11.

The point $P(3, 4)$ is reflected to P' in the x -axis; and O' is the image of O (the origin) when reflected in the line PP' . Write:

- (i) the co-ordinates of P' and O' .
- (ii) the length of the segments PP' and OO' .
- (iii) the perimeter of the quadrilateral $POP'O'$.
- (iv) the geometrical name of the figure $POP'O'$.

Solution:

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(i) Co-ordinates of P' and O' are (3, -4) and (6, 0) respectively.

(ii) $PP' = 8$ units and $OO' = 6$ units.

(iii) From the graph it is clear that all sides of the quadrilateral $POP'O'$ are equal.

In right $\triangle PO'Q$,

$$PO' = \sqrt{(4)^2 + (3)^2} = 5 \text{ units}$$

So, perimeter of quadrilateral $POP'O' = 4 PO' = 4 \times 5 \text{ units} = 20 \text{ units}$

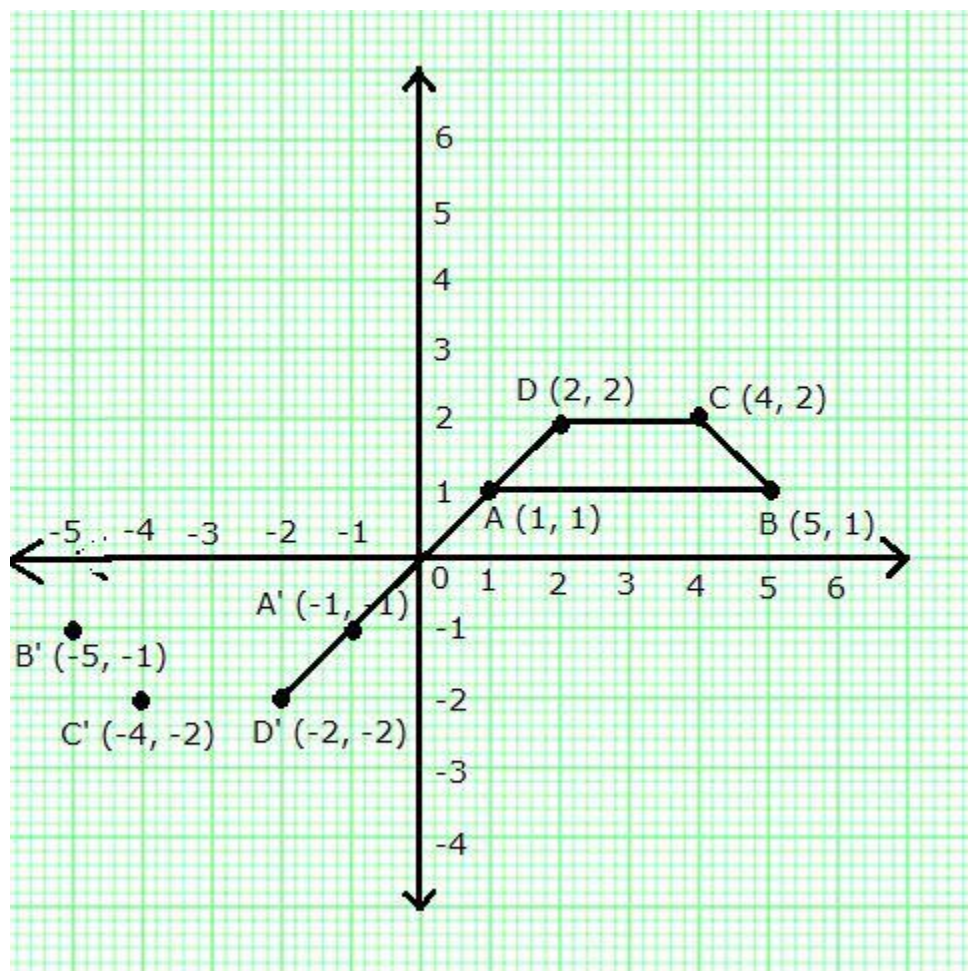
(iv) Quadrilateral $POP'O'$ is a rhombus.

Question 12.

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A (1, 1), B (5, 1), C (4, 2) and D (2, 2) are vertices of a quadrilateral. Name the quadrilateral ABCD. A, B, C, and D are reflected in the origin on to A', B', C' and D' respectively. Locate A', B', C' and D' on the graph sheet and write their co-ordinates. Are D, A, A' and D' collinear?

Solution:



Quadrilateral ABCD is an isosceles trapezium.

Co-ordinates of A', B', C' and D' are A'(-1, -1), B'(-5, -1), C'(-4, -2) and D'(-2, -2) respectively.

It is clear from the graph that D, A, A' and D' are collinear.

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Question 13.

P and Q have co-ordinates (0, 5) and (-2, 4).

- (a) P is invariant when reflected in an axis. Name the axis.**
- (b) Find the image of Q on reflection in the axis found in (i).**
- (c) (0, k) on reflection in the origin is invariant. Write the value of k.**
- (d) Write the co-ordinates of the image of Q, obtained by reflecting it in the origin followed by reflection in x-axis.**

Solution:

- (a) Any point that remains unaltered under a given transformation is called an invariant.**

It is given that P (0, 5) is invariant when reflected in an axis. Clearly, when P is reflected in the y-axis then it will remain invariant. Thus, the required axis is the y-axis.

- (b) The co-ordinates of the image of Q (-2, 4) when reflected in y-axis is (2, 4).**

- (c) (0, k) on reflection in the origin is invariant. We know the reflection of origin in origin is invariant. Thus, $k = 0$.**

- (d) Co-ordinates of image of Q (-2, 4) when reflected in origin = (2, -4)**

Co-ordinates of image of (2, -4) when reflected in x-axis = (2, 4)

Thus, the co-ordinates of the point are (2, 4).

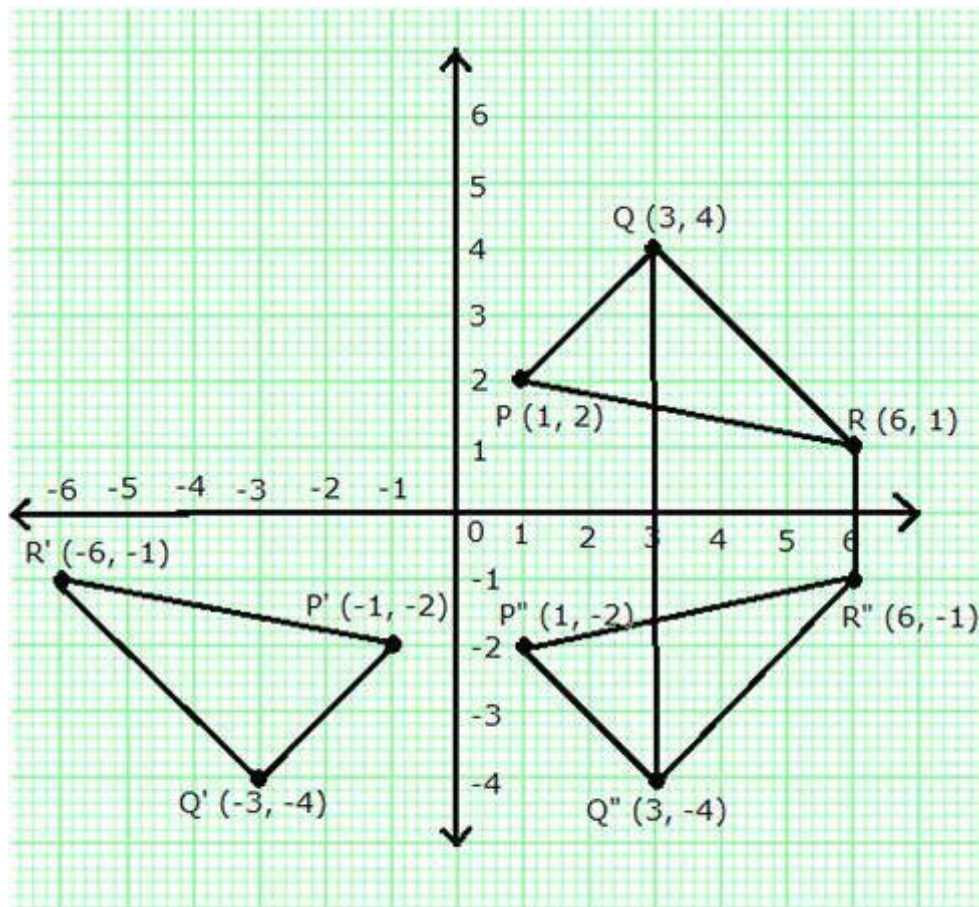
Question PQ.

The points P (1, 2), Q (3, 4) and R (6, 1) are the vertices of PQR.

- (a) Write down the co-ordinates of P', Q' and R', if P'Q'R' is the image of PQR, when reflected in the origin.**
- (b) Write down the co-ordinates of P'', Q'' and R'', if P''Q''R'' is the image of PQR, when reflected in the x-axis.**
- (c) Mention the special name of the quadrilateral QRR''Q'' and find its area.**

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Solution:



(a) The co-ordinates of P', Q' and R' are (-1, -2), (-3, -4) and (-6, -1) respectively.

(b) The co-ordinates of P'', Q'' and R'' are (1, -2), (3, -4) and (6, -1) respectively.

(c) The quadrilateral QRR''Q'' is an isosceles trapezium.

Area of QRR''Q'' = $\frac{1}{2} (RR'' + QQ'') \times \text{Height}$

= $\frac{1}{2} (2 + 8) \times 3 = 15$ sq units

Question 14.

(i) The point P (2, -4) is reflected about the line $x = 0$ to get the image Q. Find the co-ordinates of Q.

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(ii) The point Q is reflected about the line $y = 0$ to get the image R. Find the co-ordinates of R.

(iii) Name the figure PQR.

(iv) Find the area of figure PQR.

Solution:

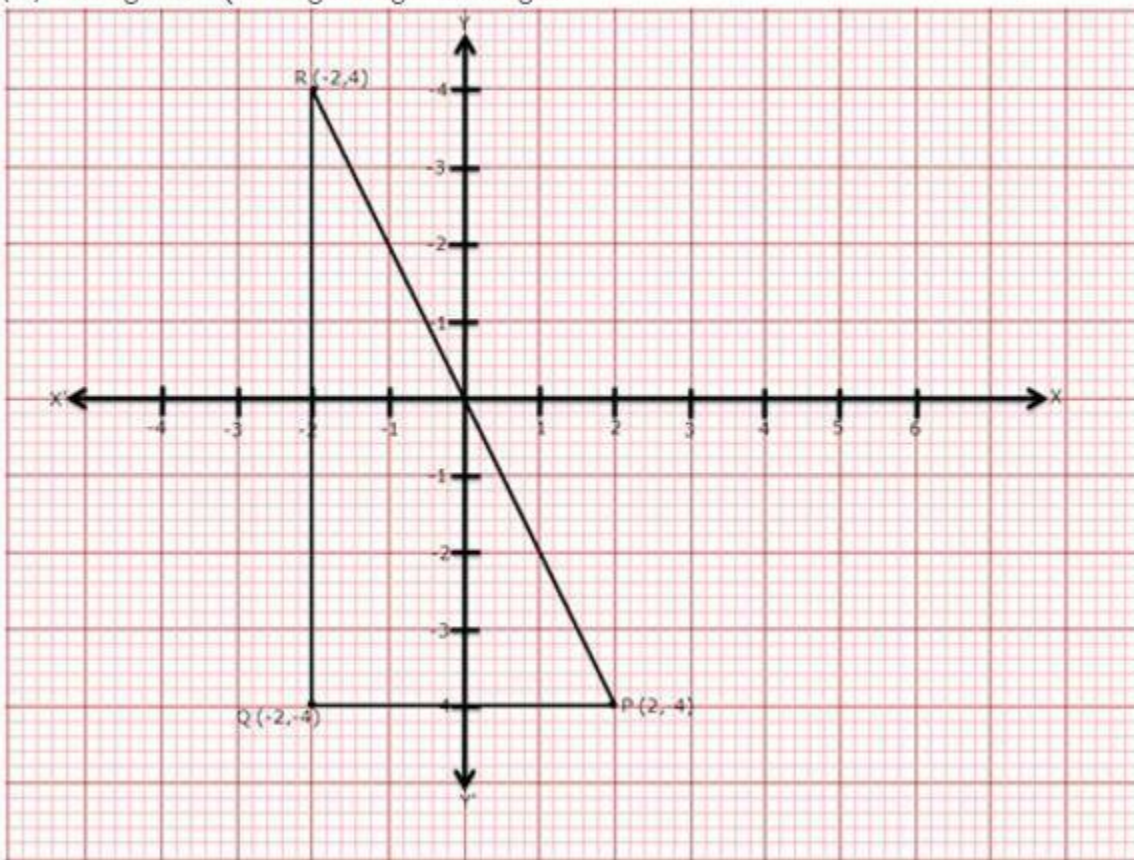
(i) P (2, -4) is reflected in ($x = 0$) y-axis to get Q.

$P(2, -4) \xrightarrow{My} Q(-2, -4)$

(ii) Q (-2, -4) is reflected in ($y = 0$) x-axis to get R.

$Q(-2, -4) \xrightarrow{Mx} R(-2, 4)$

(iii) The figure PQR is right angled triangle.



(iv) Area of $\Delta PQR = \frac{1}{2} \times PQ \times QR = \frac{1}{2} \times 4 \times 8 = 16$ sq. units

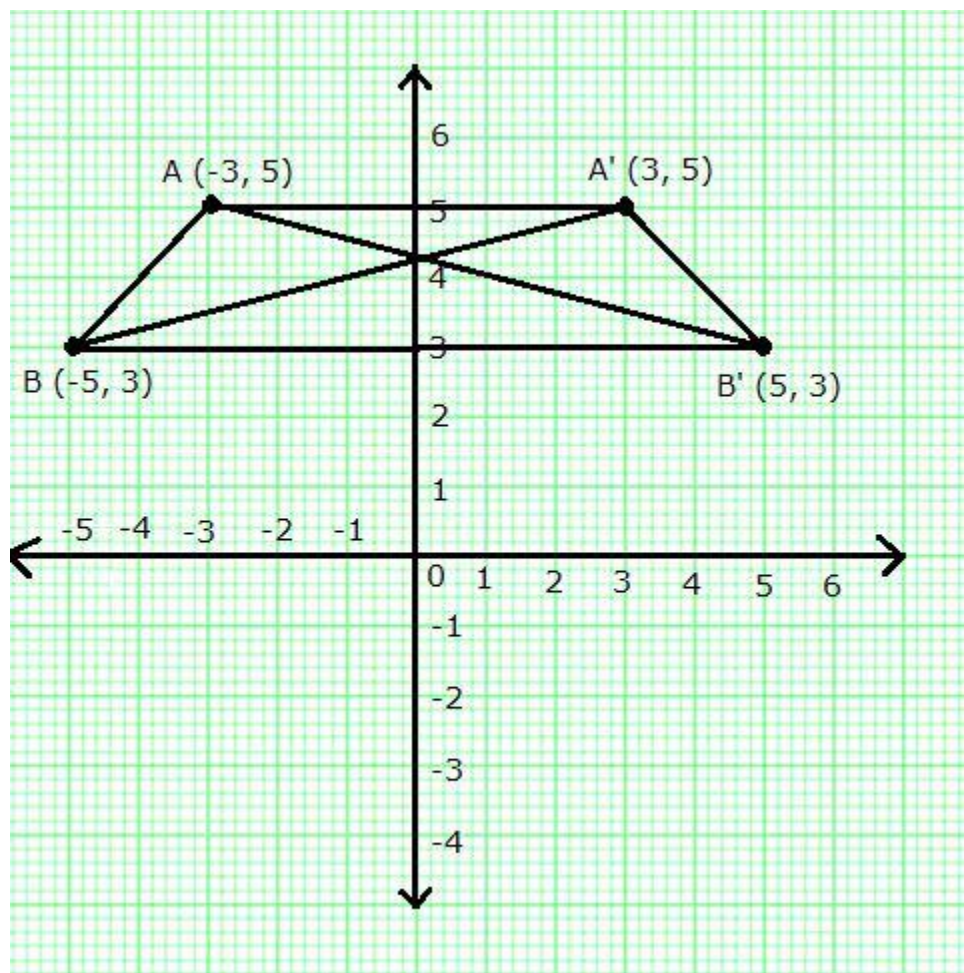
<https://www.indcareer.com/schools/selina-class-10-icse-solutions-mathematics-chapter-12-reflection/>

Question PQ.

A' and B' are images of $A (-3, 5)$ and $B (-5, 3)$ respectively on reflection in y -axis. Find:

- (a) the co-ordinates of A' and B' .
- (b) Assign special name of quadrilateral $AA'B'B$.
- (c) Are AB' and BA' equal in length?

Solution:



(a) The co-ordinates of A' and B' are $(3, 5)$ and $(5, 3)$.

(b) Quadrilateral $AA'B'B$ is an isosceles trapezium.

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(c) Yes, AB' and BA' are equal in length.

Question 15.

Using a graph paper, plot the point A (6, 4) and B (0, 4).

(a) Reflect A and B in the origin to get the image A' and B' .

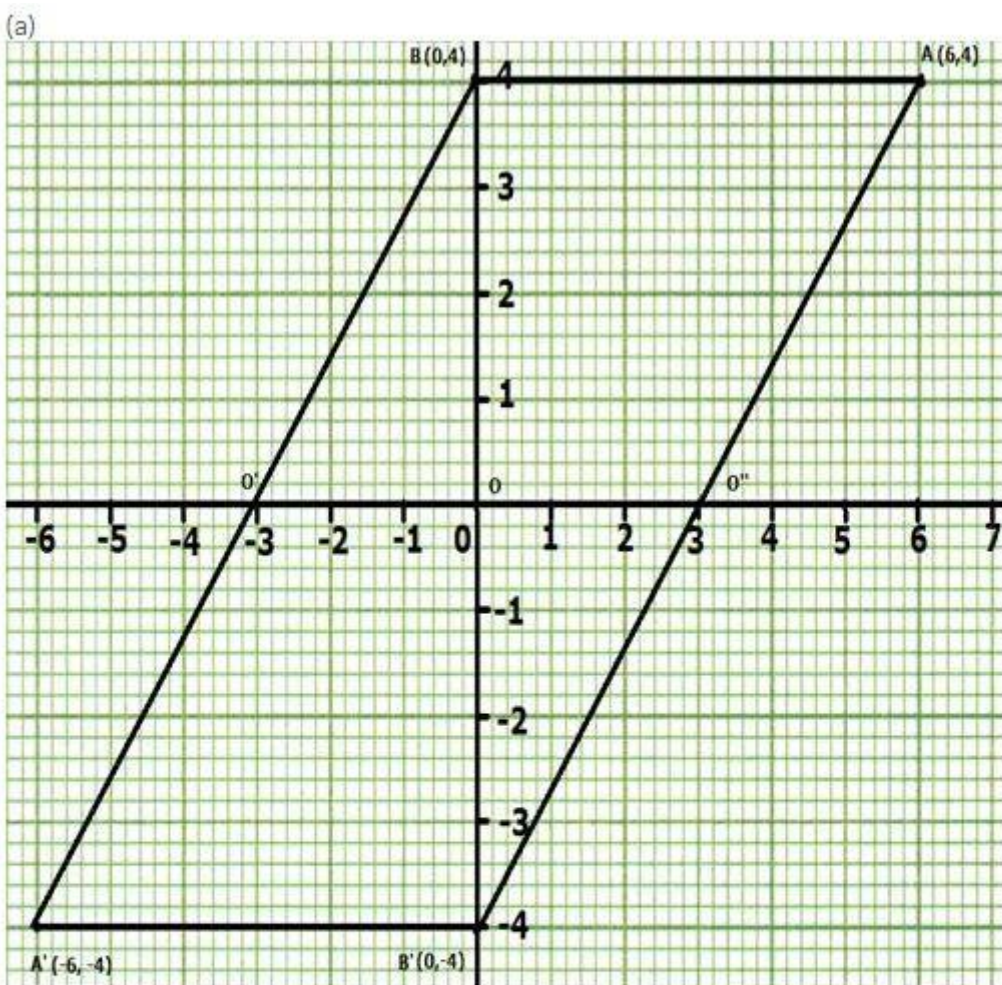
(b) Write the co-ordinates of A' and B' .

(c) State the geometrical name for the figure $ABA'B'$.

(d) Find its perimeter.

Solution:

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(b) Co-ordinates of $A' = (-6, -4)$

Co-ordinates of $B' = (0, -4)$

(c) $ABA'B'$ is a parallelogram.

(d) In $\triangle ABA'B'$, $BB' = 8$ units, $A'B' = 6$ units

$$\therefore BA' = \sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10 \text{ units}$$

$$\Rightarrow B'A = 10 \text{ units}$$

$$AB = A'B' = 6 \text{ units}$$

$$\therefore \text{Perimeter of } ABA'B' = AB + BA' + A'B' + B'A = 6 + 10 + 6 + 10 = 32 \text{ units}$$

Question 16.

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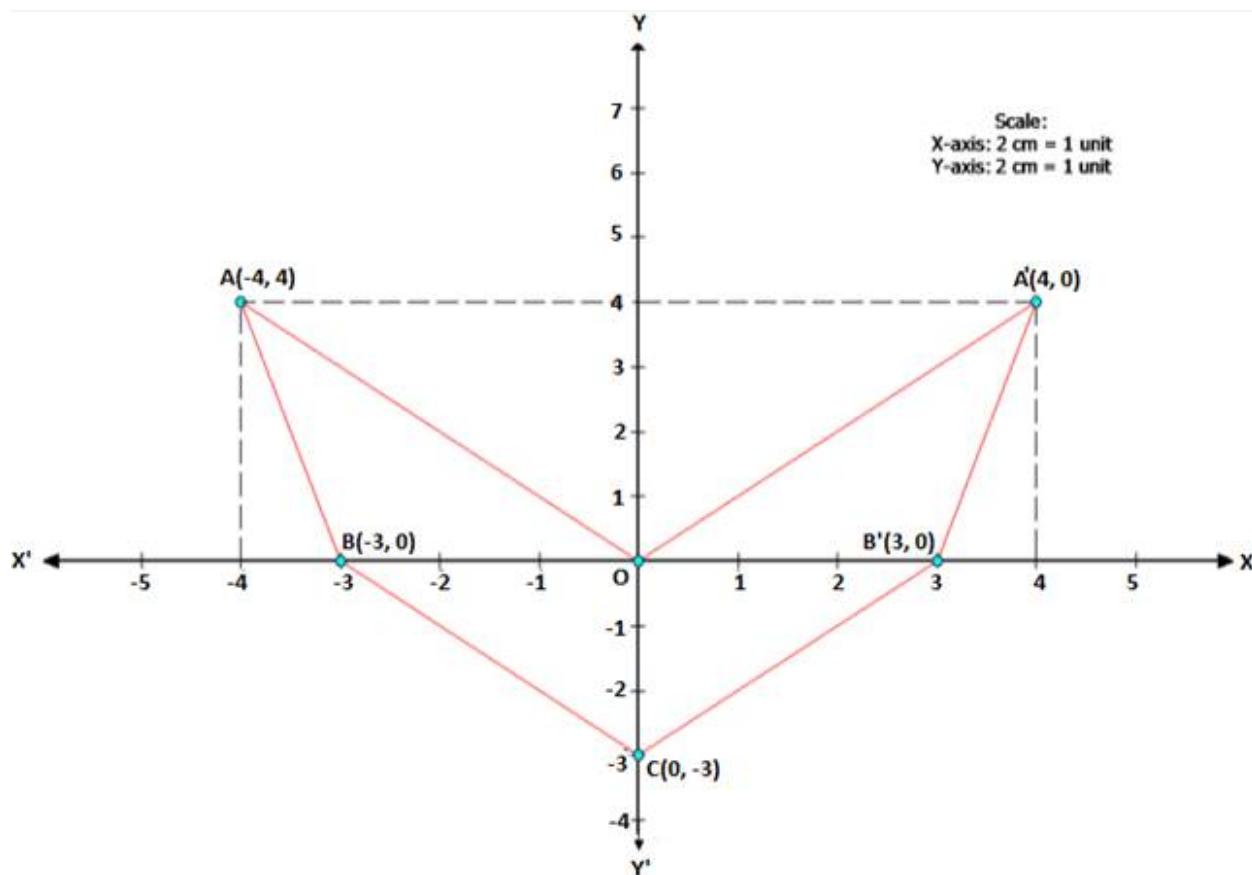
Use graph paper for this question. (Take 2 cm = 1 unit along both x and y axis. Plot the points O (0, 0), A (-4, 4), B (-3, 0) and C (0, -3)

(i) Reflect points A and B on the y-axis and name them A' and B' respectively. Write down their coordinates.

(ii) Name the figure OACB'A'.

(iii) State the line of symmetry of this figure.

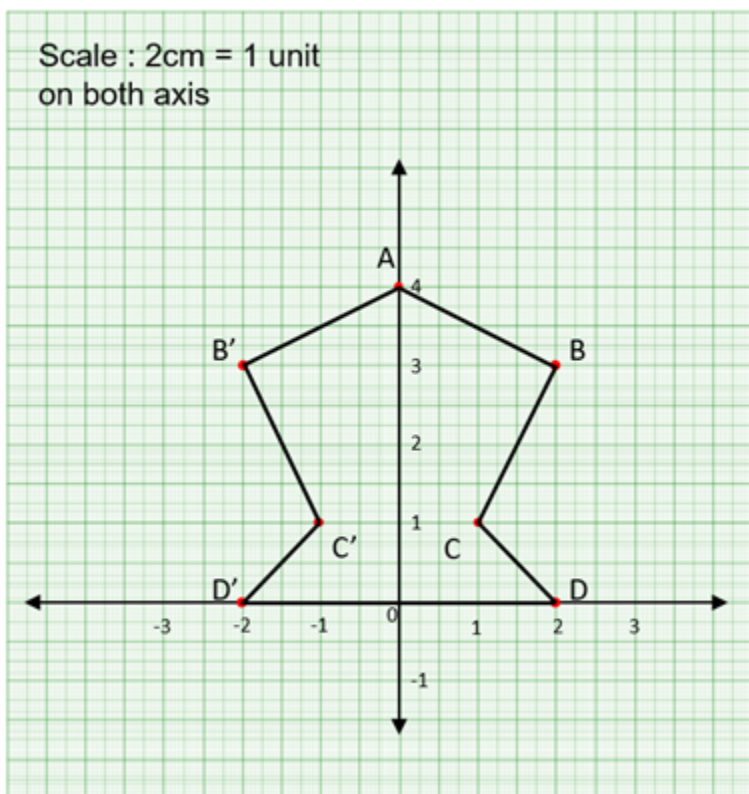
Solution:



1. $A' = (4, 4)$ AND $B' = (3, 0)$
2. The figure is an arrow head.
3. The y-axis i.e. $x = 0$ is the line of symmetry of figure OACB'A'.

Question 17.

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- (i) Plotting $A(0, 4)$, $B(2, 3)$, $C(1, 1)$ and $D(2, 0)$.
- (ii) Reflected points $B'(-2, 3)$, $C'(-1, 1)$ and $D'(-2, 0)$.
- (iii) The figure is symmetrical about $x = 0$



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