→ Reflection (Easy)   → Shear ✗   (2017
→ Rotation (Tricky)   → Stretch ✗   (& Before)
→ Translation (Easiest)
→ Enlargement (Medium)

→ Transformation Matrices (O Level Only)

① Reflection

→ Line of reflection

P   �│   ꟼ

object   └────────────┘ → Image
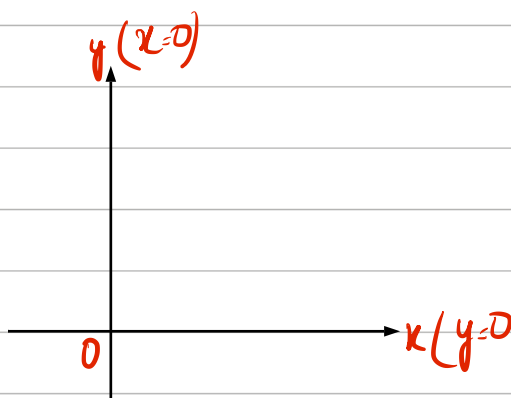
→ Perpendicular distance
  remains the same
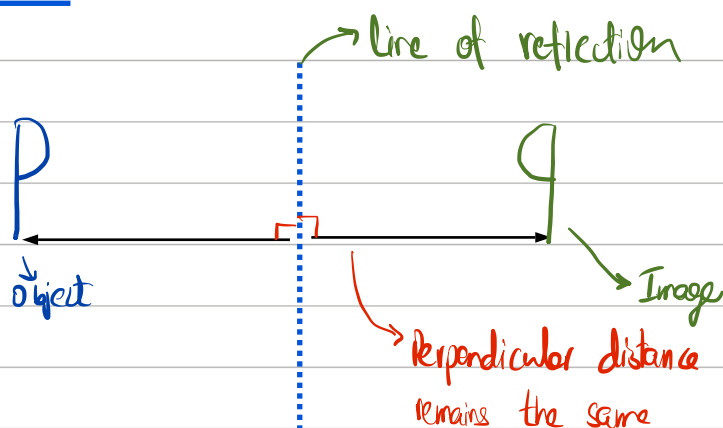
① Shape & size remains the same (inverted)
② Image & the object are equidistant from the line of reflection
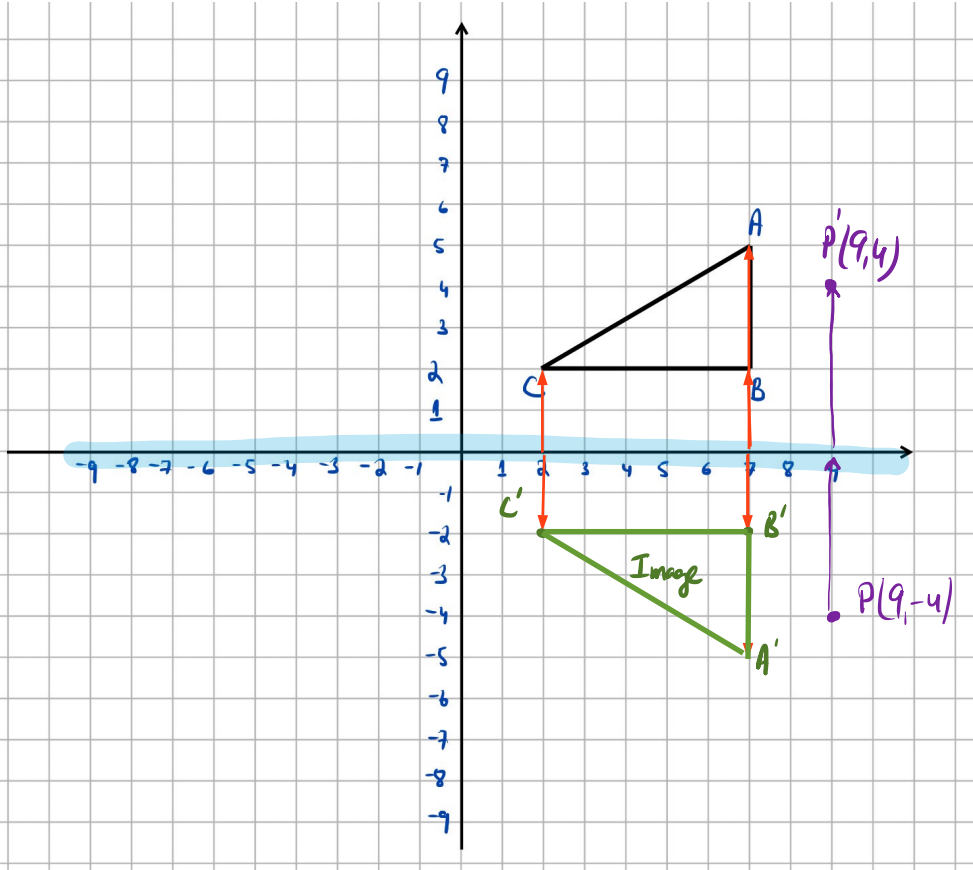
Defined by :
          ① Line of Reflection

Standard Cases

① Along the x-axis / y=0
② Along the y-axis / x=0
③ Along the line y=x
④ Along the line y=-x

$y^{(x=0)}$

0 ──────────→ $x(y=0)$

① Along the x-axis or $y = 0$

Reflect $\triangle ABC$ along the line $y = 0$

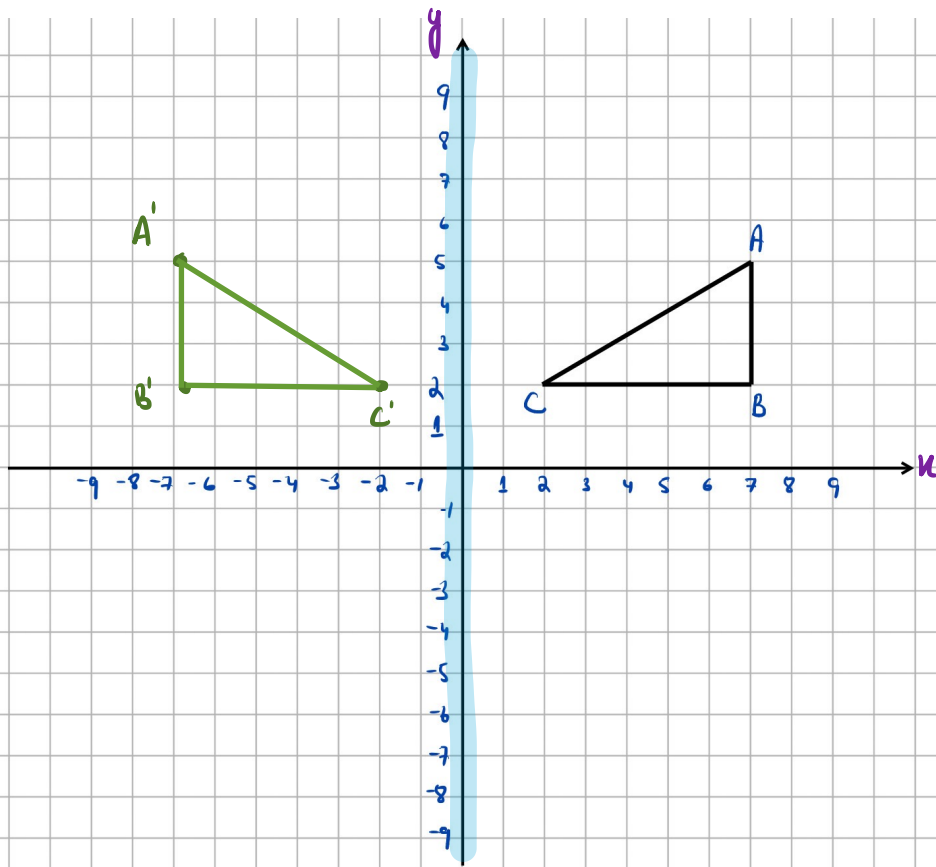

$A(7, 5) \longrightarrow A'(7, -5)$

$B(7, 2) \longrightarrow B'(7, -2)$

$C(2, 2) \longrightarrow C'(2, -2)$

$P(x, y) \longrightarrow P'(x, -y)$

ⓐ Along the y-axis

Reflect △ABC along the line x=0

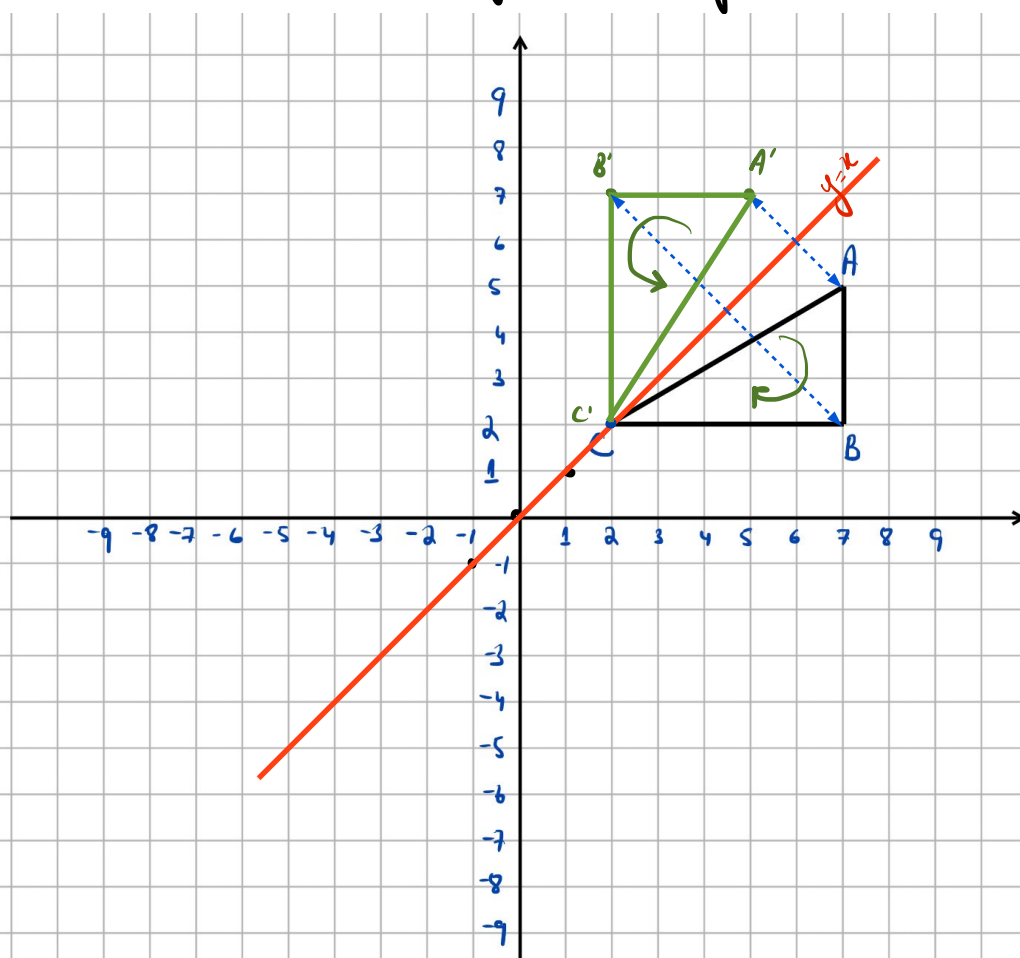$A(7,5) \longrightarrow A'(-7,5)$

$B(7,2) \longrightarrow B'(-7,2)$

$C(2,2) \longrightarrow C'(-2,2)$

$P(x,y) \longrightarrow P'(-x,y)$

③ $y = x$

Reflect $\triangle ABC$ along the line $y = x$

$y=x$			
x	-1	0	1
y	-1	0	1

$A(7, 5) \longrightarrow A'(5, 7)$

$B(7, 2) \longrightarrow B'(2, 7)$
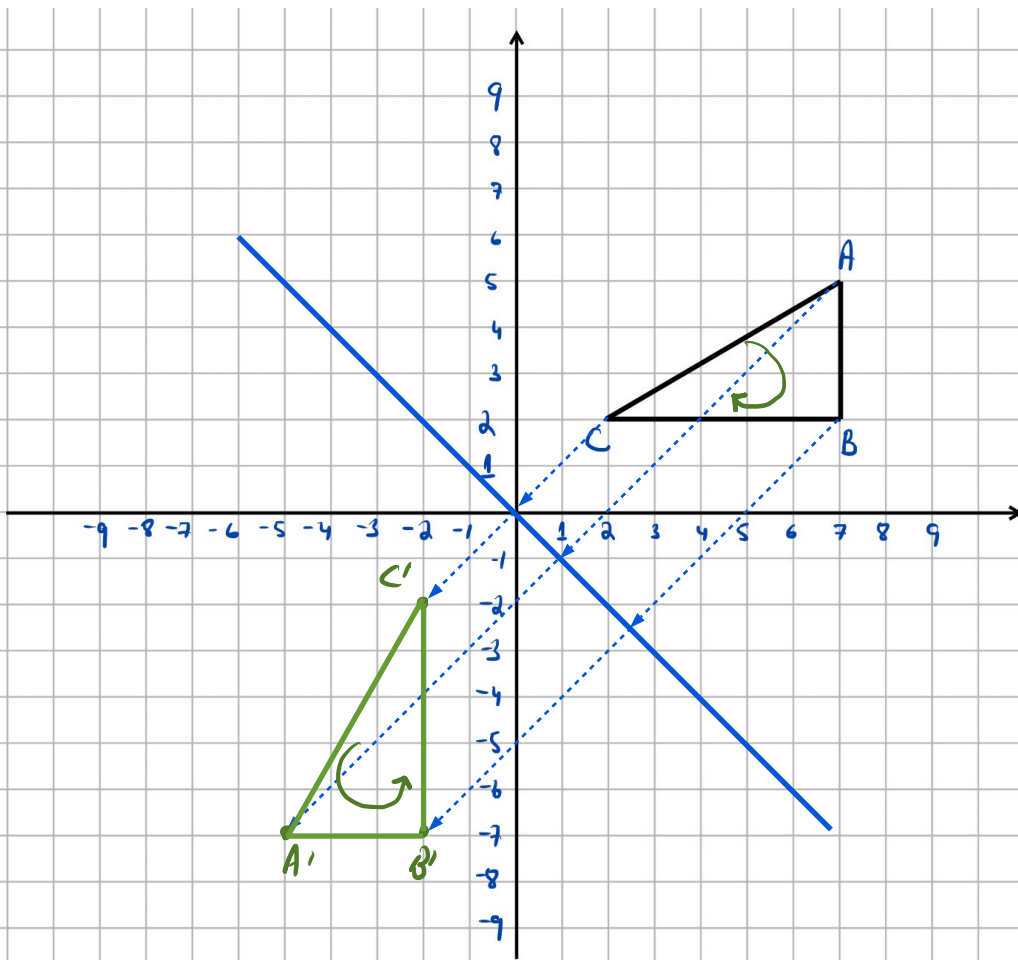
$C(2, 2) \longrightarrow C'(2, 2)$

$P(x, y) \rightarrow P(y, x)$

$\searrow$ Invariant Point

Point(s) that remain
unchanged. In reflection
all the points lying
on the line of reflection
are invariant.

④ $y = -x$

Reflect $\triangle ABC$ along the line $y = -x$

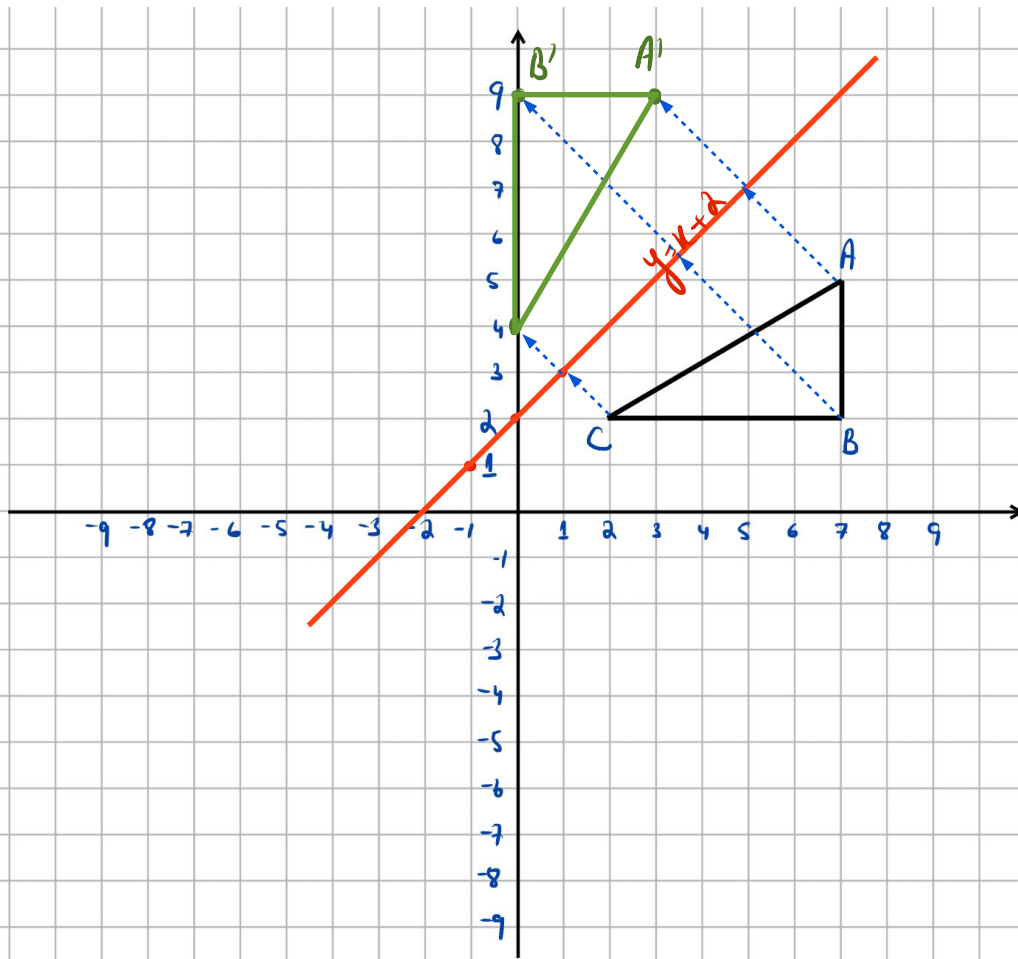$A(7, 5) \longrightarrow A'(-5, -7)$

$B(7, 2) \longrightarrow B'(-2, -7)$

$C(2, 2) \longrightarrow C'(-2, -2)$

$P(x, y) \rightarrow P(-y, -x)$
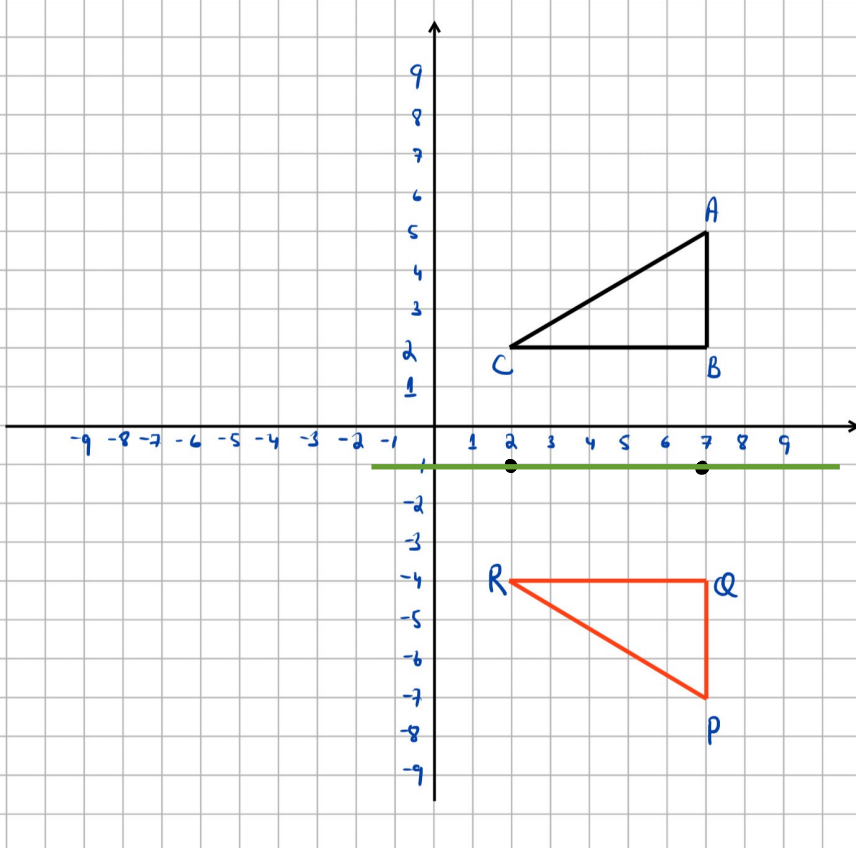
→ Reflection along any other line

Reflect ΔABC along the line $y = k + 2$

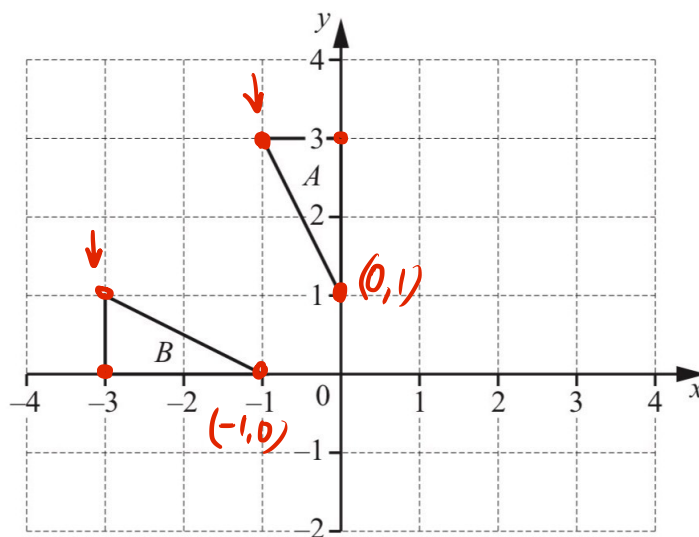| x	-1	0	1
y	1	2	3

→ How to find the line of Reflection?

Example 1

Step 1: Find the Midpoint of A & A'

Step 2: Find the Midpoint of B & B'

Step 3: Join the two points found in s1 & s2

$$y = -1$$

Example 2

$(0,1)$ $(-1,0)$
$(0,3)$ $(-3,0)$
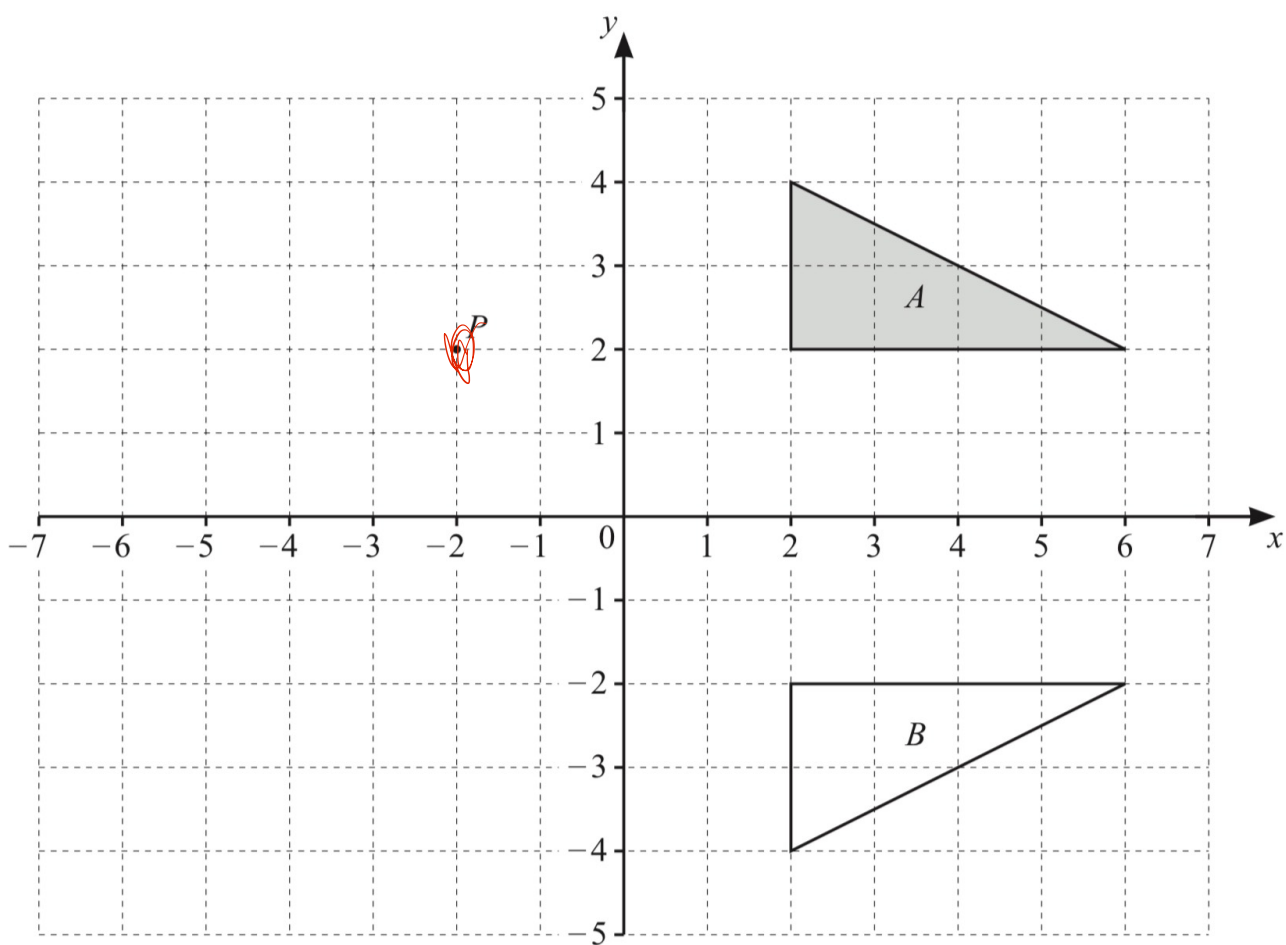$(-1,3)$ $(-3,1)$
$(x,y) \rightarrow (-y,-x)$

The diagram shows triangles A and B.

(a) Describe fully the **single** transformation that maps triangle A onto triangle B.

Reflection, along the line $(y = -x)$

[1]   [2]

$y = 0$

Equation: $y = 0$