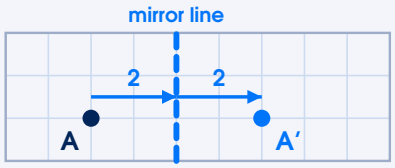
REFLECTIONS IN HORIZONTAL AND VERTICAL LINES

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

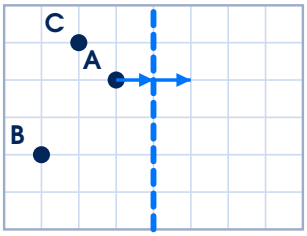
KEY IDEA

1. **Count the squares from the point to the mirror line.**
2. Count the same number of squares on the other side.
3. Mark the new point. Join the points to make the shape.



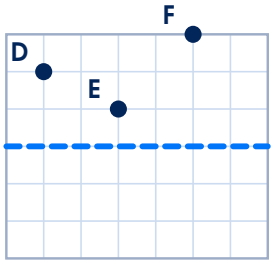
1 Reflect each point in the dashed mirror line. Mark the new point.

a)



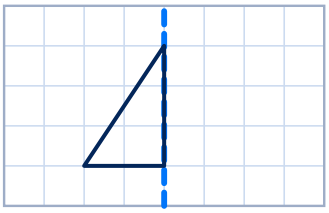
started for you

b)

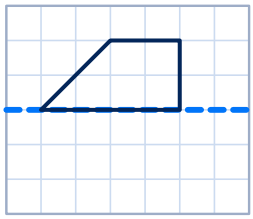


2 Reflect each shape in the mirror line. The shapes touch the line.

a)



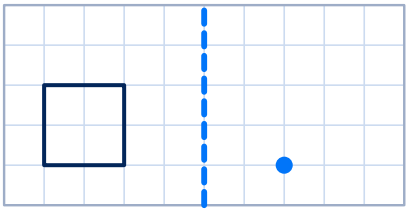
b)



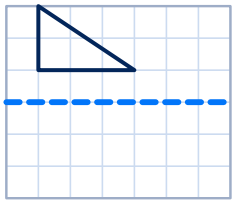
3 Reflect each shape in the mirror line. Reflect one corner at a time.

In a) one corner has been done for you (the blue dot).

a)

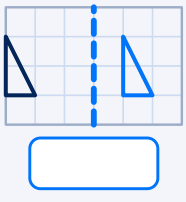


b)

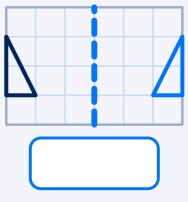


4 The blue shape should be a reflection of the navy shape. Is it correct? Write YES or NO.

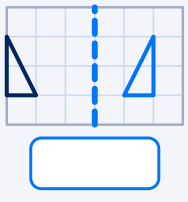
a



b



c



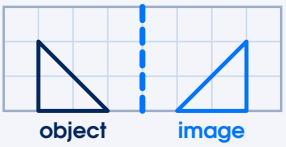
REFLECTIONS IN HORIZONTAL AND VERTICAL LINES

SUPPORT

NAME _____ CLASS _____ DATE _____

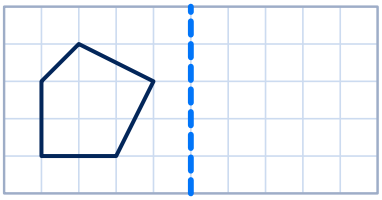
KEY IDEA

The object is the shape you start with; the image is the reflected shape. Each corner of the image is the same distance from the mirror line as the object corner, on the other side.

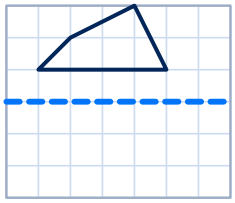


1 Reflect each shape in the dashed mirror line.

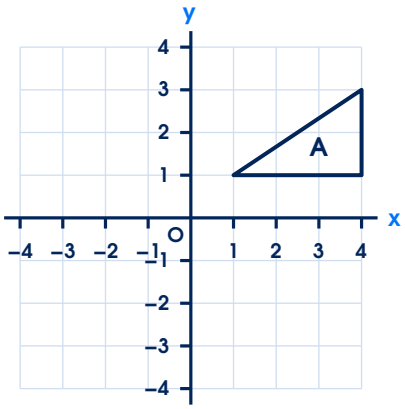
a)



b)



2 Use the coordinate grid.



a) Reflect shape A in the y-axis. Label the image B.

b) The corner at (4, 3) moves to _____

c) The corner at (1, 1) moves to _____

3 Reflect each point. Write the coordinates of its image.

POINT	(3, 1)	(−2, 4)	(5, −3)
reflect in the y-axis			
reflect in the x-axis			

4 Is the blue shape a correct reflection of the navy shape? Write YES or NO.

a



_____

b



_____

c



_____

REFLECTIONS IN HORIZONTAL AND VERTICAL LINES

CORE

NAME _____ CLASS _____ DATE _____

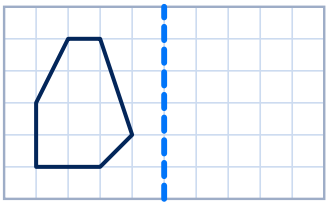
KEY IDEA

Reflect one vertex at a time, the same distance from the mirror line on the other side. The image is congruent to the object. Reflecting in the y-axis changes the sign of the x-coordinate; reflecting in the x-axis changes the sign of the y-coordinate.

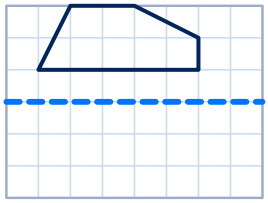
FLUENCY

1 Reflect each shape in the dashed mirror line.

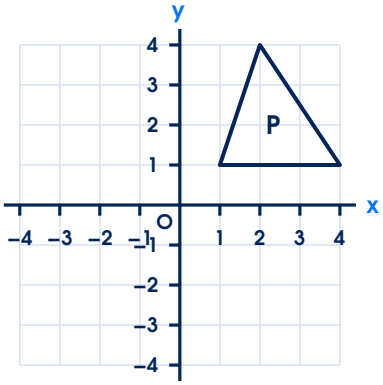
a)



b)



2 Use the coordinate grid.



a) Reflect P in the x-axis. Label it Q.

b) Reflect P in the y-axis. Label it R.

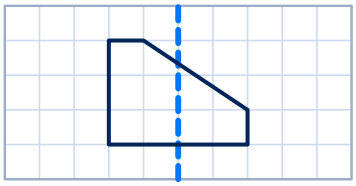
Where does the vertex (4, 1) go after the reflection?

c) in shape Q ____

d) in shape R ____

REASONING

3 This shape crosses the mirror line. Reflect the whole shape.



Tip: reflect the part on each side of the line.

4 Jo reflects the point (3, –2) in the y-axis. She says the image is (3, 2). Explain Jo's mistake and write the correct image.

.....

.....

REFLECTIONS IN HORIZONTAL AND VERTICAL LINES

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, sketch an example of when it is true and when it is not.

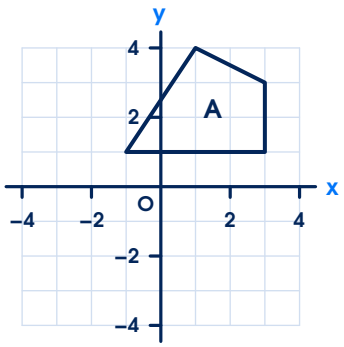
a) Reflecting in the y-axis keeps the y-coordinates. ALWAYS SOMETIMES NEVER

b) A point on the mirror line moves when reflected. ALWAYS SOMETIMES NEVER

c) Reflecting in the x-axis changes the quadrant. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 Use the coordinate grid.



a) Reflect A in the x-axis. Label it B.

b) Reflect B in the y-axis. Label it C.

c) Describe how you could move A straight onto C in one step.

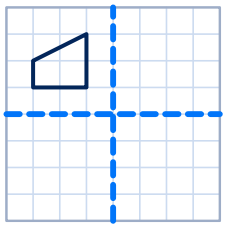
3 A triangle has vertices (1, 2), (4, 2) and one more vertex. Reflected in the y-axis, its image has vertices (−1, 2), (−4, 2) and (−2, 5).

a) What are the coordinates of the third vertex of the triangle? (,)

b) Shape S lands exactly on itself when reflected in the x-axis. What must be true about S?

★ CHALLENGE FOR ALL

4 Complete the design.



a) Reflect the shape so that both dashed lines are lines of symmetry of the whole design.

b) How many shapes are in the finished design? ____

c) What is its order of rotational symmetry? ____

REFLECTIONS IN A LINE FROM ITS EQUATION · ANSWERS

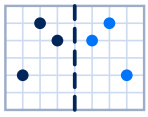
ANSWERS

BUILDING BLOCKS

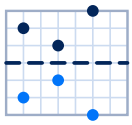
1–3 see the diagrams (navy = object, blue = image)

4 a) NO (it has slid across, not flipped) · b) YES · c) NO (it is 1 square too close to the line)

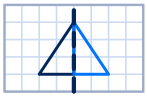
1a



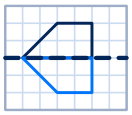
1b



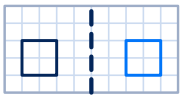
2a



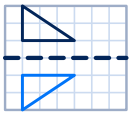
2b



3a



3b



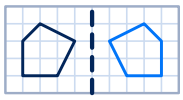
SUPPORT

2 B has vertices (–1, 1), (–4, 1), (–4, 3) · b) (–4, 3) · c) (–1, 1)

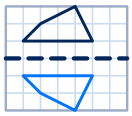
3 (3, 1) → (–3, 1) and (3, –1) · (–2, 4) → (2, 4) and (–2, –4) · (5, –3) → (–5, –3) and (5, 3)

4 a) YES · b) NO (it has slid down, not flipped) · c) NO (it has also moved sideways)

1a



1b

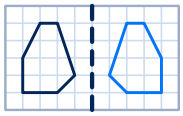


CORE

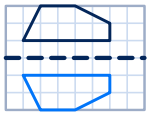
2 Q: (1, –1), (4, –1), (2, –4) · R: (–1, 1), (–4, 1), (–2, 4) · c) (4, –1) · d) (–4, 1)

4 Jo changed the y-coordinate. Reflecting in the y-axis keeps the y-coordinate and changes the sign of the x-coordinate, so the image is (–3, –2).

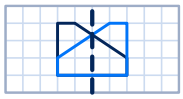
1a



1b



3



GREATER DEPTH

1 a) always · b) never (points on the line stay where they are) · c) sometimes (not if the shape crosses or touches the x-axis, e.g. a shape with corners above and below the axis)

2 B: (–1, –1), (3, –1), (3, –3), (1, –4) · C: (1, –1), (–3, –1), (–3, –3), (–1, –4) · c) a half turn (rotation of 180°) about the origin

3 a) (2, 5) · b) the x-axis is a line of symmetry of the shape (the shape is the same above and below it)

4 a) see diagram · b) 4 · c) 2 (the design looks the same after a half turn)

4

