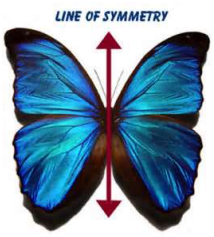
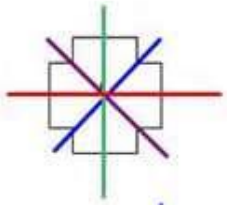
7.5 Line Symmetry and Reflections

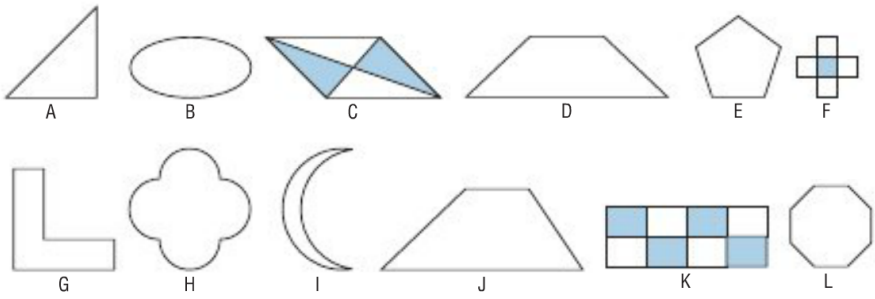
Line Symmetry = A shape that can be divided into 2 congruent parts, so that each part is a mirror image of the other.

Examples:



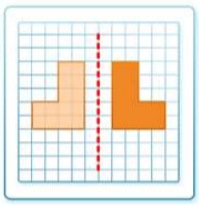


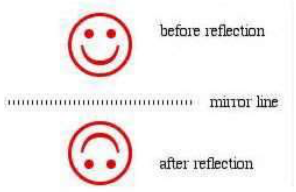
Determine how many **lines of symmetry** each shape has.



Reflection = A transformation that is illustrated by a shape and its image, with a line of reflection between.

Examples:



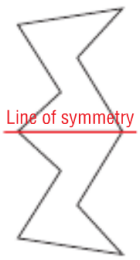


Line of Reflection = Line of Symmetry

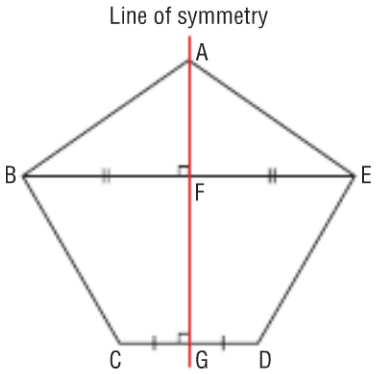
If a mirror is placed along one side of a shape, the reflection image and the original shape together form one larger shape. The line of reflection is a line of symmetry of this larger shape.

Original Shape

Original Shape and Its Reflection Image



Line Symmetry



The pentagon ABCDE has one line of symmetry.

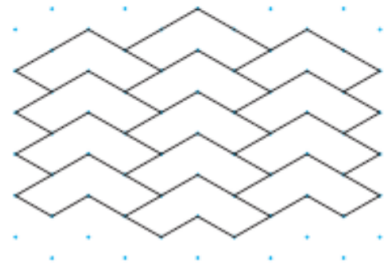
- AEDG is congruent to ABCG

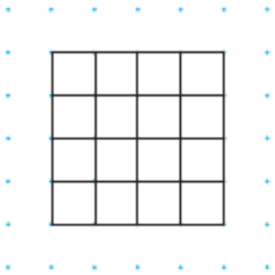
Each point on one side of the line of symmetry has a corresponding point on the other side of the line.

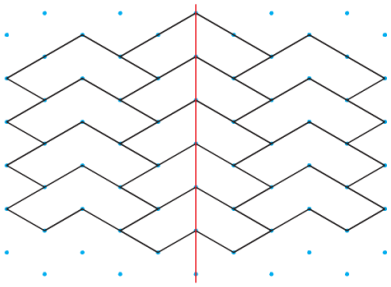
- A corresponds to A
- E corresponds to B
- D corresponds to C
- G corresponds to G

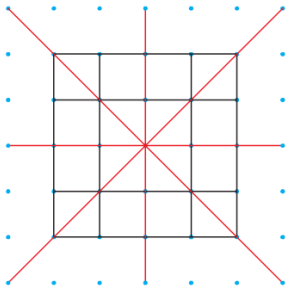
Note: Corresponding points are **EQUIDISTANT** (the SAME distance) from the line of symmetry.

Identify the **Lines of Symmetry** in Tessellations





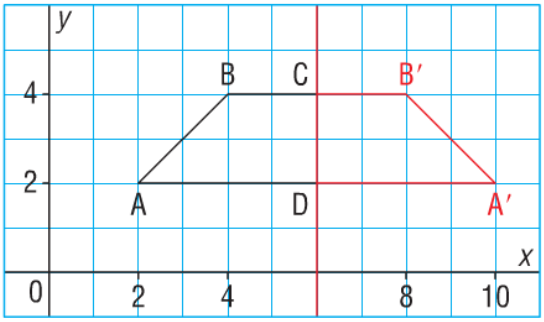




Reflections

The quadrilateral ABCD is reflected over the reflection line x = 6.

- A'B'CD is the reflected image

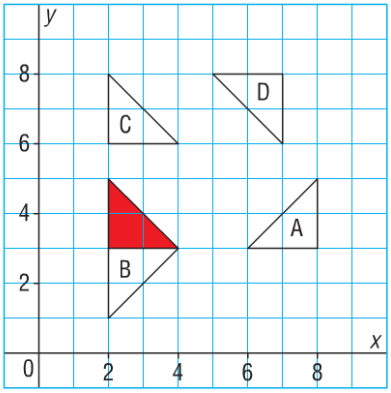


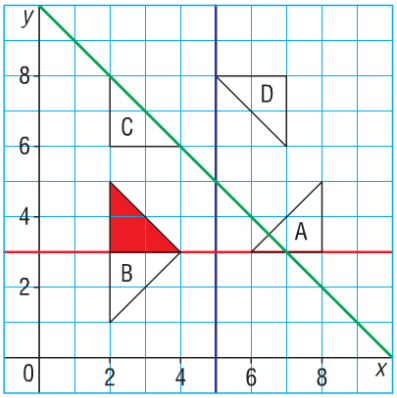
Each image point is the same distance from the reflection line as the corresponding original point.

- A corresponds to A'
- B corresponds to B'
- C corresponds to C
- D corresponds to D

Note: Corresponding points are **EQUIDISTANT** (the SAME distance) from the reflection line.

Identify shapes related by a **Line of Reflection**.



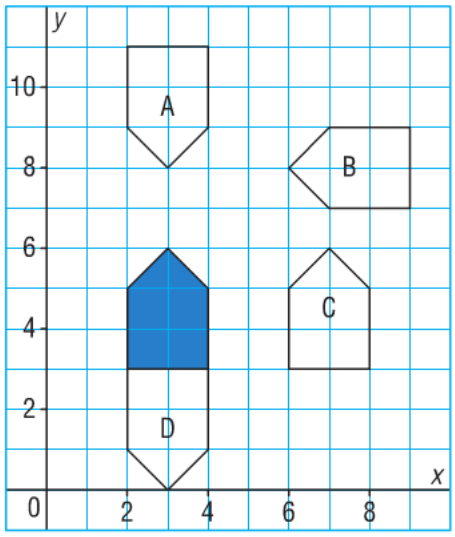


Questions

1. How many lines of symmetry does each symbol have?

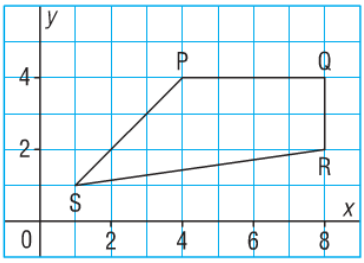
1 1 0 3 0 1

2. **Choose** the pentagons that are related to the blue pentagon by a line of reflection, and **identify** the line of reflection.

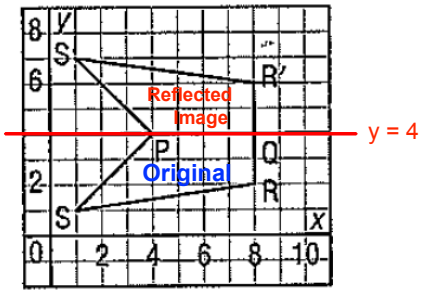


A: Line of reflection is y = 7
B: Not a reflected image
C: Line of reflection is x = 5
D: Line of reflection is y = 3

3. Quadrilateral PQRS is part of a larger shape.



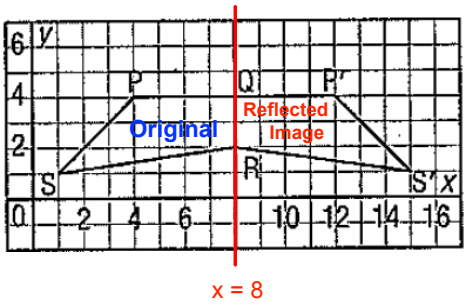
a) Draw the image of PQRS after a reflection in the horizontal line y=4.



Write the coordinates of the image points.

P(4, 4) Q(8, 4) R'(8, 6) S'(1, 7)

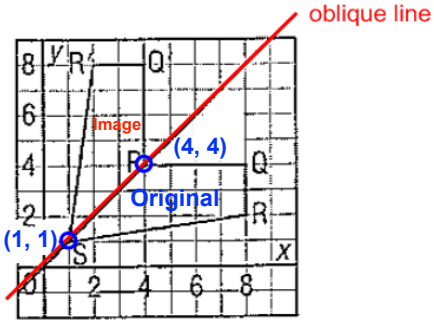
b) Draw the image of PQRS after a reflection in the vertical line x=8.



Write the coordinates of the image points.

P'(12, 4) Q(8, 4) R(8, 2) S'(15, 1)

c) Draw the image of PQRS after a reflection in the oblique line through (1,1) and (4,4)

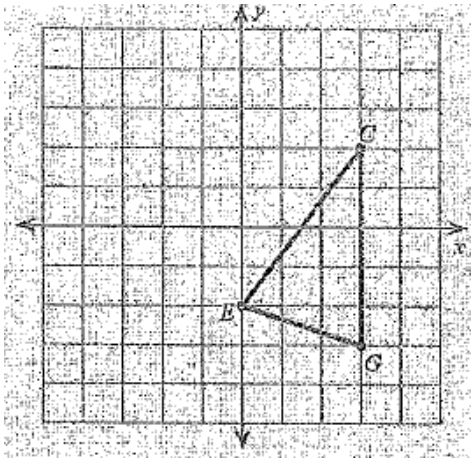


Write the coordinates of the image points.

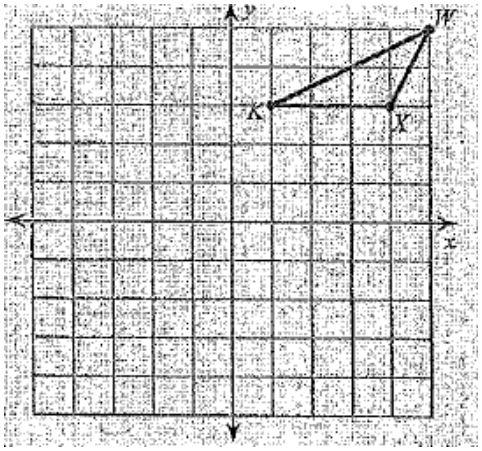
P(4, 4) Q'(4, 8) R'(2, 8) S(1, 1)

4. Graph the image of the figure using the transformation given.

Reflection across the x-axis



Reflection across the y = 2



Reflection across the x = -3