

Chapter 13 (SYMMETRY)

गुम्हरी ३० (मैच/मार्च)

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Symmetrical figures: Figures with evenly balanced proportions, are said to be symmetrical figures

A line of symmetry: A figure has line symmetry if a line can be drawn, dividing the figure into two identical parts.

→ The line symmetry is closely related to mirror reflection; i.e. the two halves are mirror images of each other.

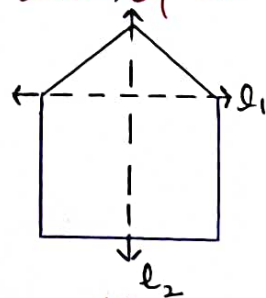
Exercise 13.1

1 List any four symmetrical objects from your home or school.

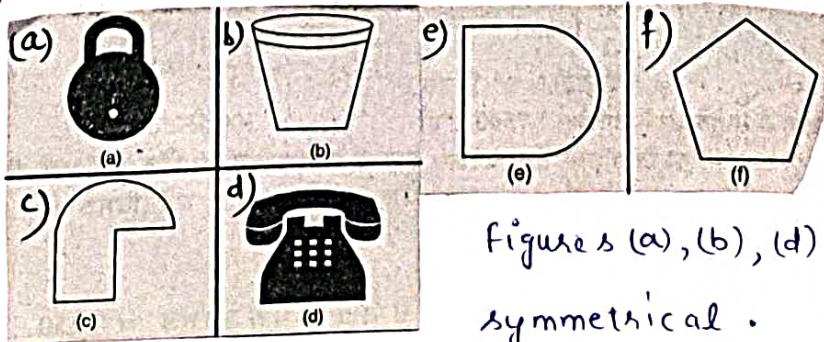
Soln: Black board, Table top, Computer disc and Chart paper

2 For the given figure, which one is the mirror line; l_1 or l_2 ?

Soln: l_2 is a mirror line



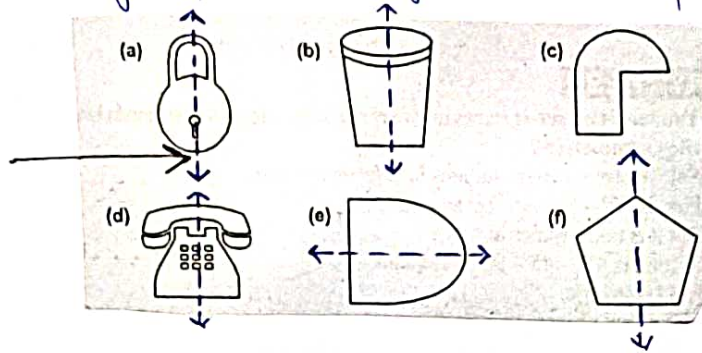
3 Identify the shapes given below. Check whether, they are symmetric or not. Draw the line of symmetry as well.



Figures (a), (b), (d), (e) and (f) are symmetrical.

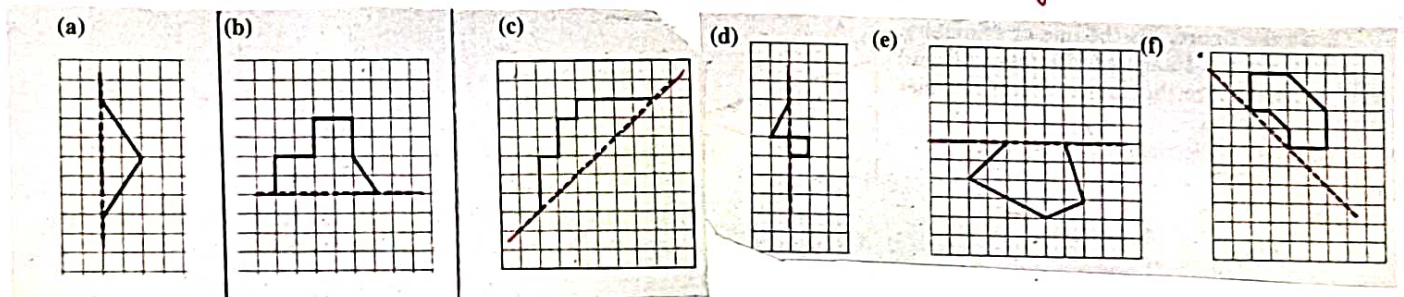
Line of symmetry of these figures, is as follows:

line of symmetry

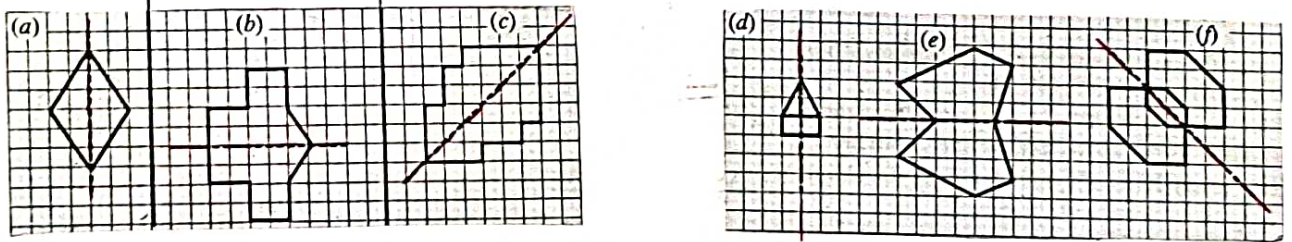


(c) figure (c) has no line of symmetry

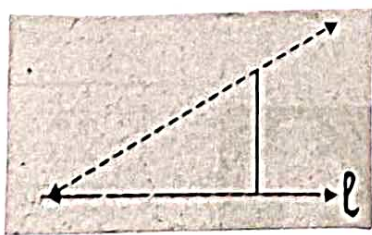
4 Copy the following on a squared paper. The complete them such that the dotted line is the line of symmetry.



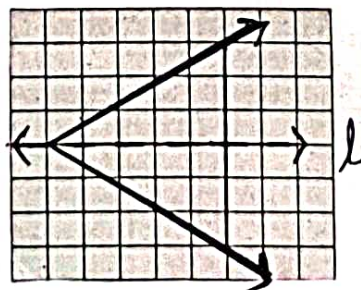
Soln:



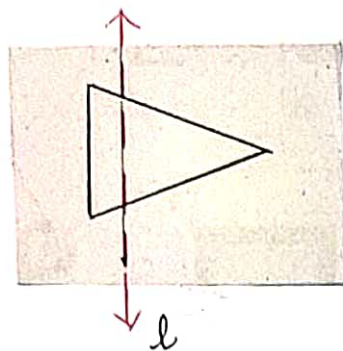
5 In the figure l is the line of symmetry. Complete the diagram to be symmetric.



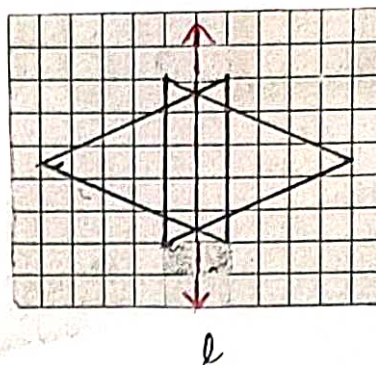
Soln:-



6 In the figure, l is the line of symmetry. Draw the image of the triangle and complete the diagram so that it becomes symmetric.



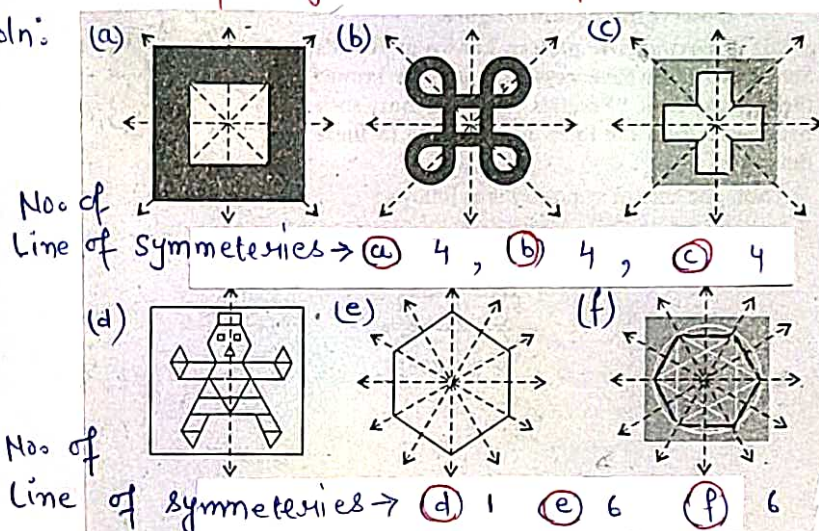
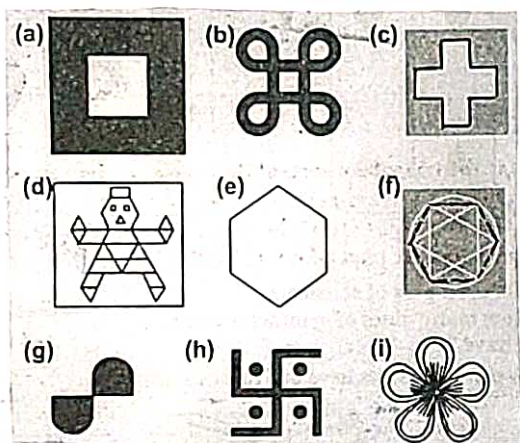
Soln:



Exercise 13.2

1 Find the number of lines of symmetries for each shape:

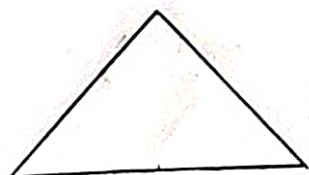
Soln:



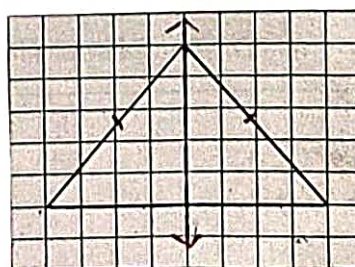
No. of line of symmetries $\rightarrow$ (a) 4, (b) 4, (c) 4, (d) 1, (e) 6, (f) 6, (g) No, (h) No, (i) 5

2 Copy the triangle in each figure, on a squared paper. In each case, draw the lines of symmetry if any and identify the type of triangle

(a)



Soln:



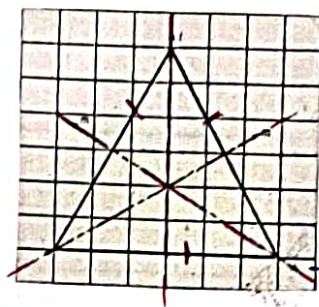
No. of line of symmetries = 1

Isosceles triangle

(b)



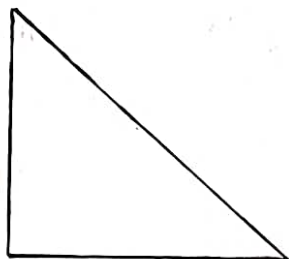
Soln:



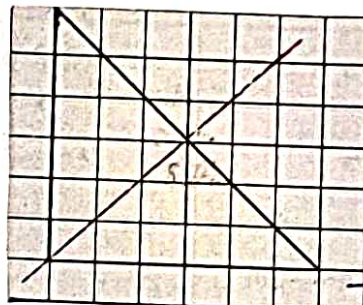
No. of Line
of Symmetries
= 3

→ Equilateral
triangle

(c)



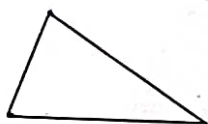
Soln:



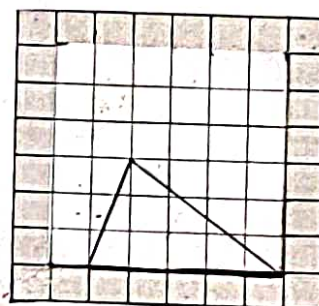
Line of
Symmetries
= 1

→ Right Angled
Isosceles
triangle

(d)



Soln:

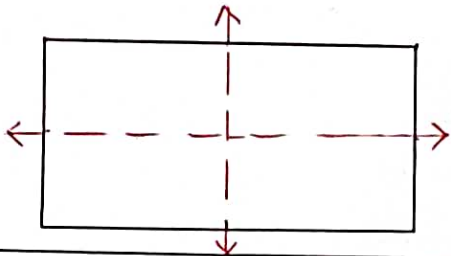
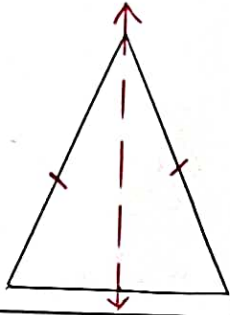
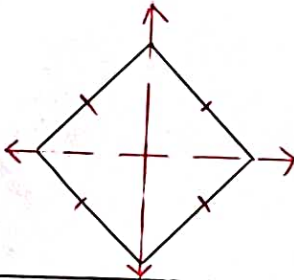
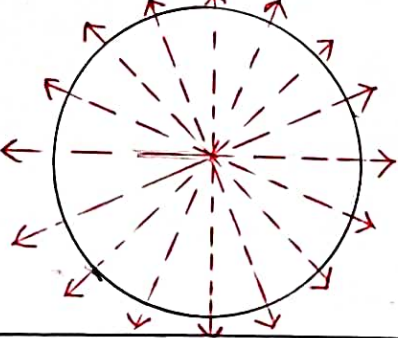


No line of
Symmetry

Scalene triangle

3 Complete the following table:

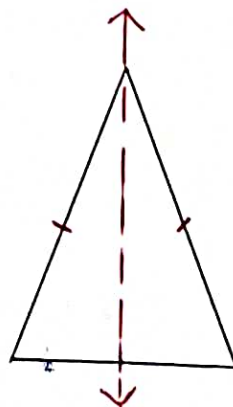
Shape	Rough Figure	No. of Lines of Symmetries
Equilateral Triangle		3
Square		4

Shape	Rough Figure	No. of Lines of Symmetries
Rectangle		2
Isosceles triangle		1
Rhombus		2
Circle		Infinite

4 Can you draw a triangle which has

a) Exactly one line of symmetry.

Soln: Yes, Isosceles triangle has only one line of symmetry

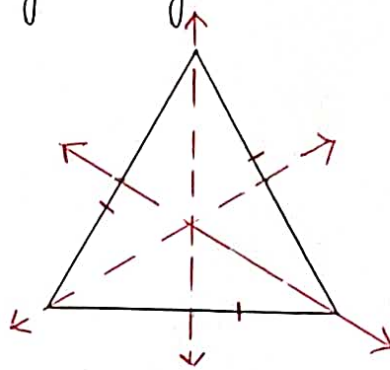


b) Exactly two lines of symmetry.

Soln: No, there is not any triangle having 2 lines of symmetry

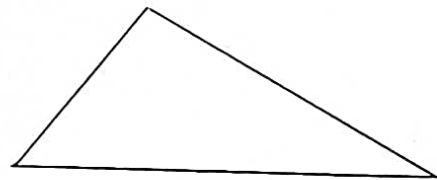
c) Exactly three lines of symmetry.

Soln: Yes, An equilateral triangle have 3 lines of symmetry.



d) No line of symmetry

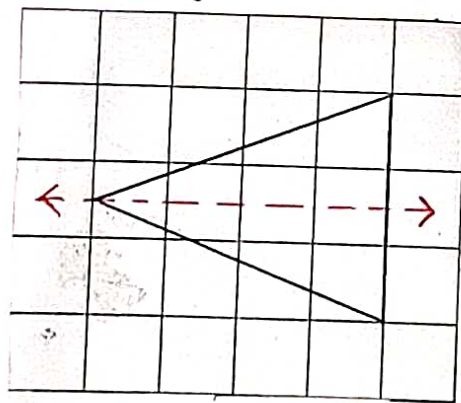
Soln: Yes, Scalene triangle has no line of symmetry



5 On a squared paper, sketch the following:

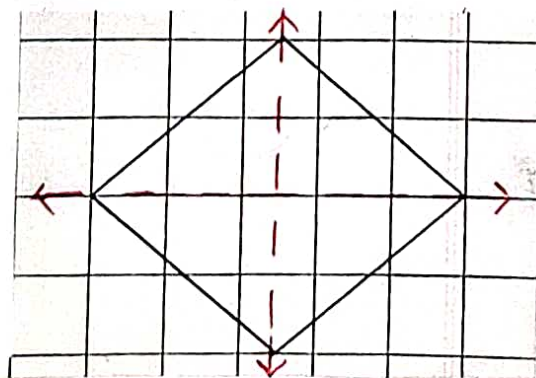
a) A triangle with a horizontal line of symmetry, but no vertical line of symmetry.

Soln.



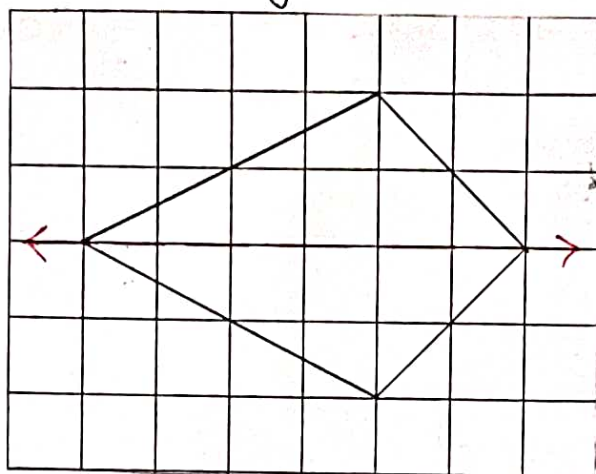
b) A quadrilateral, with horizontal and vertical lines of symmetry.

Soln.



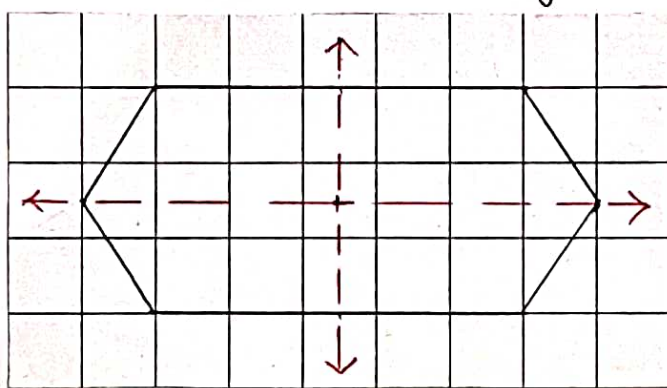
c) A quadrilateral, with a horizontal line of symmetry, but no vertical line of symmetry.

Soln.



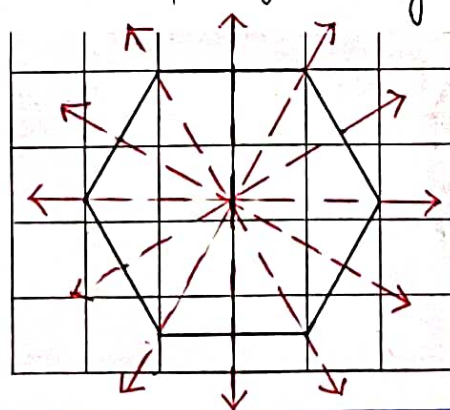
d) A hexagon with exactly 2 lines of symmetry.

Soln.



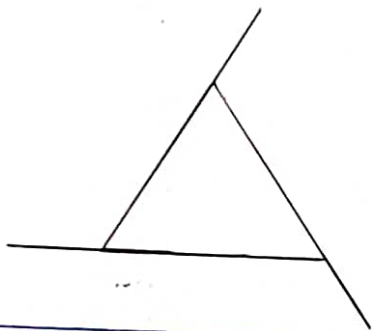
e) A hexagon with 6 lines of symmetry.

Soln.

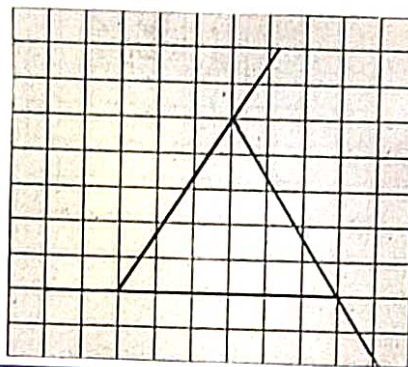


6 Trace each figure and draw the line of symmetry if any :

(a)

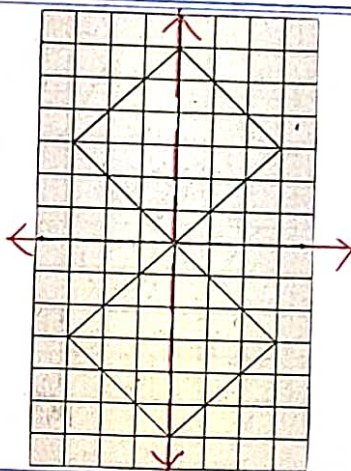
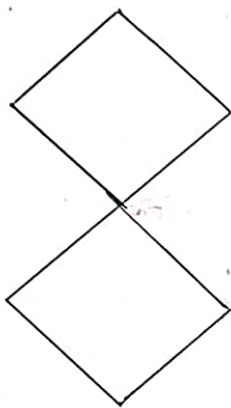


Soln.



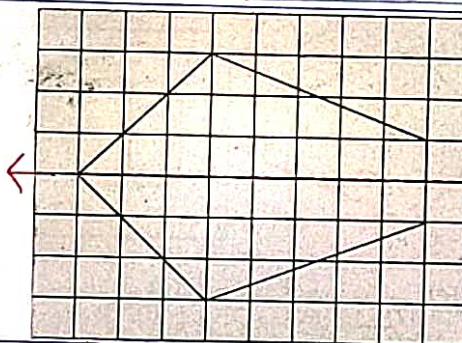
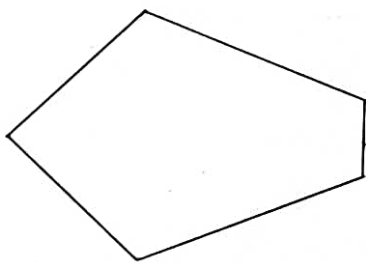
No line
of sym-
metry

(b)



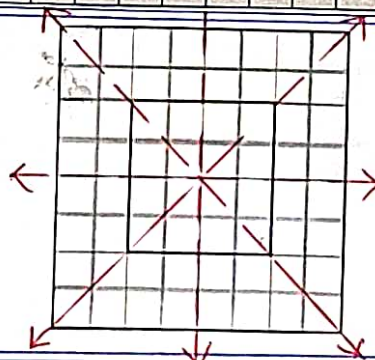
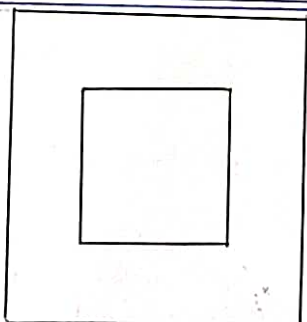
2 lines of
symmetry

(c)



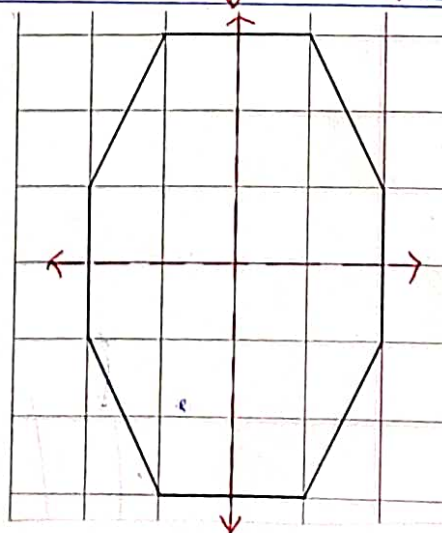
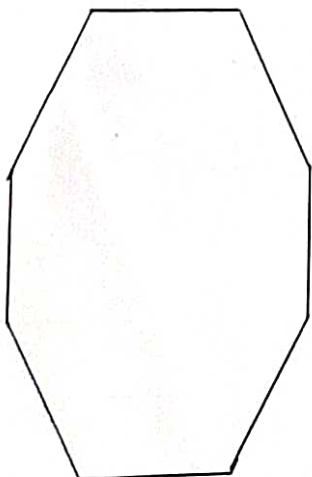
1 line
of
symmetry

(d)



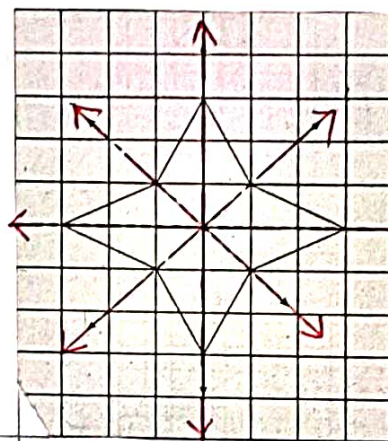
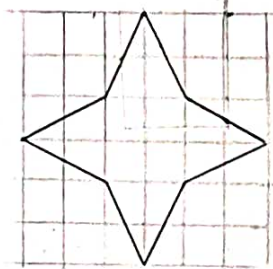
4 lines of
symmetry

(e)



2 lines
of
symmetry

(f)



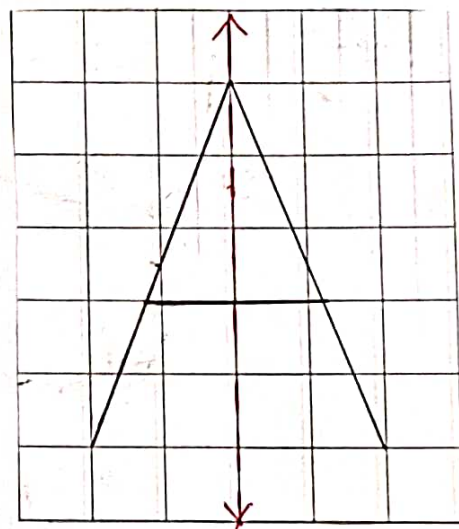
4 lines
of
symmetry

7 Consider the letters of English alphabets A to Z. List among them the letters which have;

a) Vertical lines of symmetry (like A)

Soln. Alphabet letters, having vertical lines of symmetry like A are:

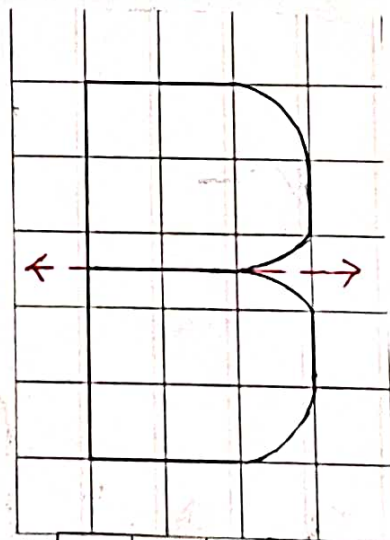
H, I, M, O, T, U, V, W,
X, Y



b) Horizontal lines of symmetry (like B)

Soln. Alphabet letters, having horizontal lines of symmetry like B are:

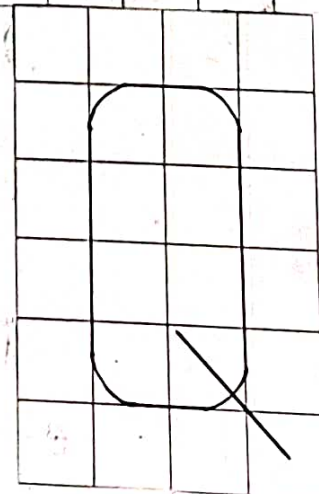
C, D, E, H, I, K, O, X



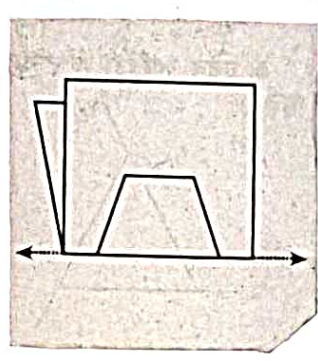
c) No lines of symmetry (like Q)

Soln. Alphabets having no lines of symmetry like Q are:

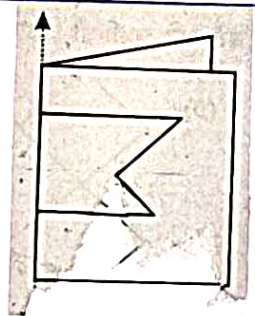
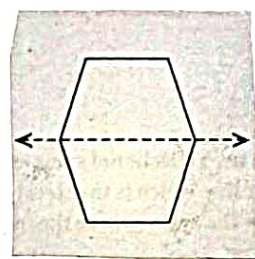
F, G, J, L, N, P, R, S, Z



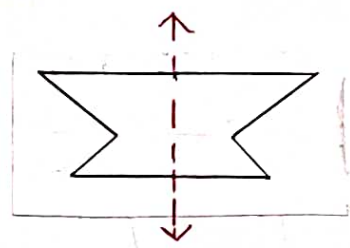
8 Given here are figures of a few folded sheets and designs drawn about the fold. In each case, draw a rough diagram of the complete figure that would be seen when the design is cut off.



Soln.



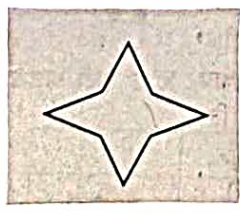
Soln.



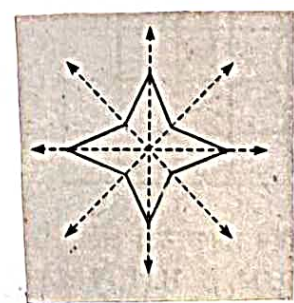
Exercise 13.3

1 Find the number of lines of symmetry in each of the following shapes

(a)

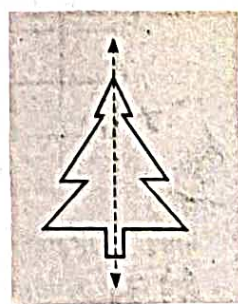


Soln.



4

(b)

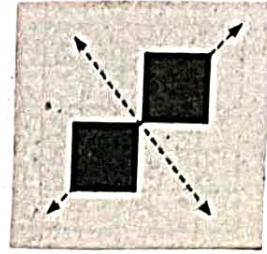


1

(c)

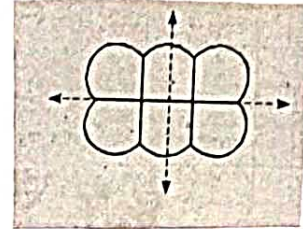
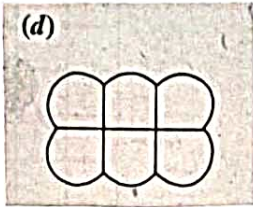


Soln.



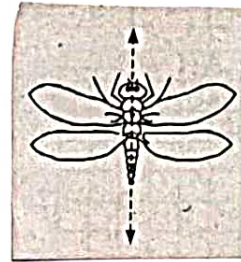
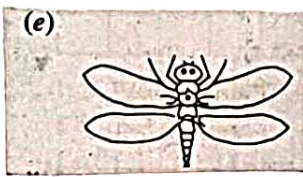
2

(d)



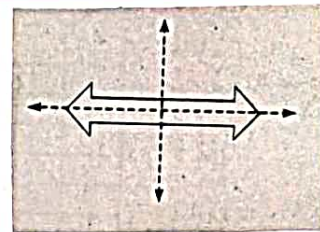
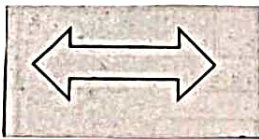
2

(e)



1

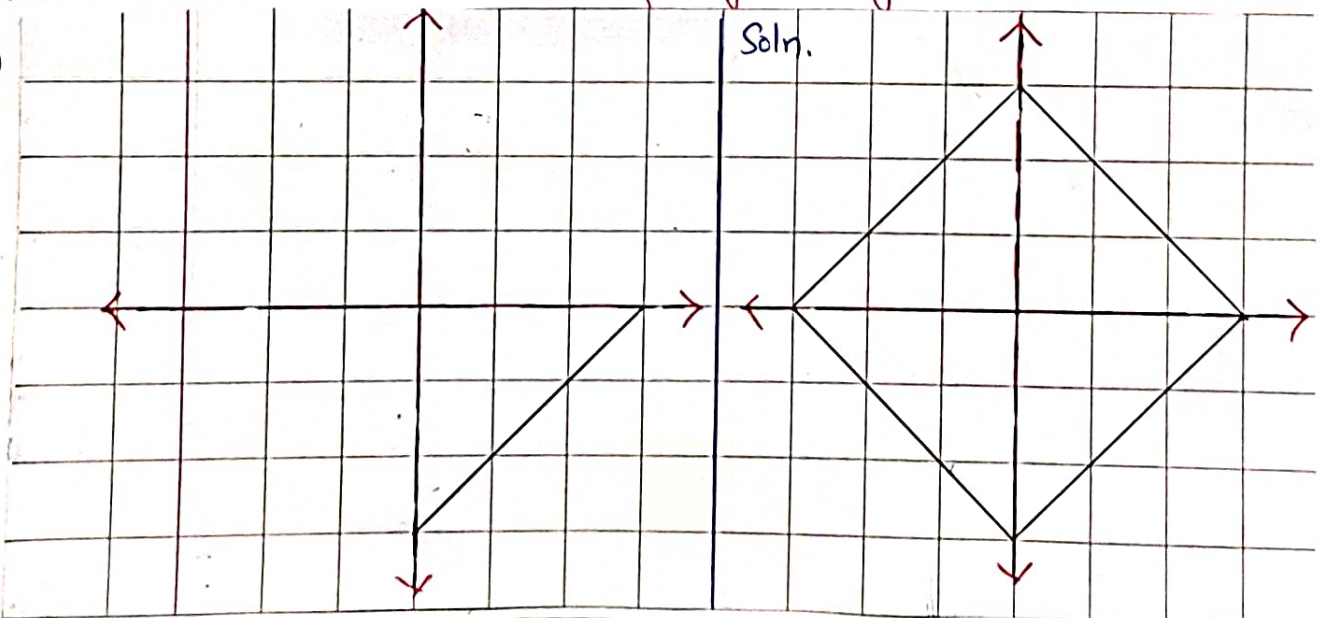
(f)

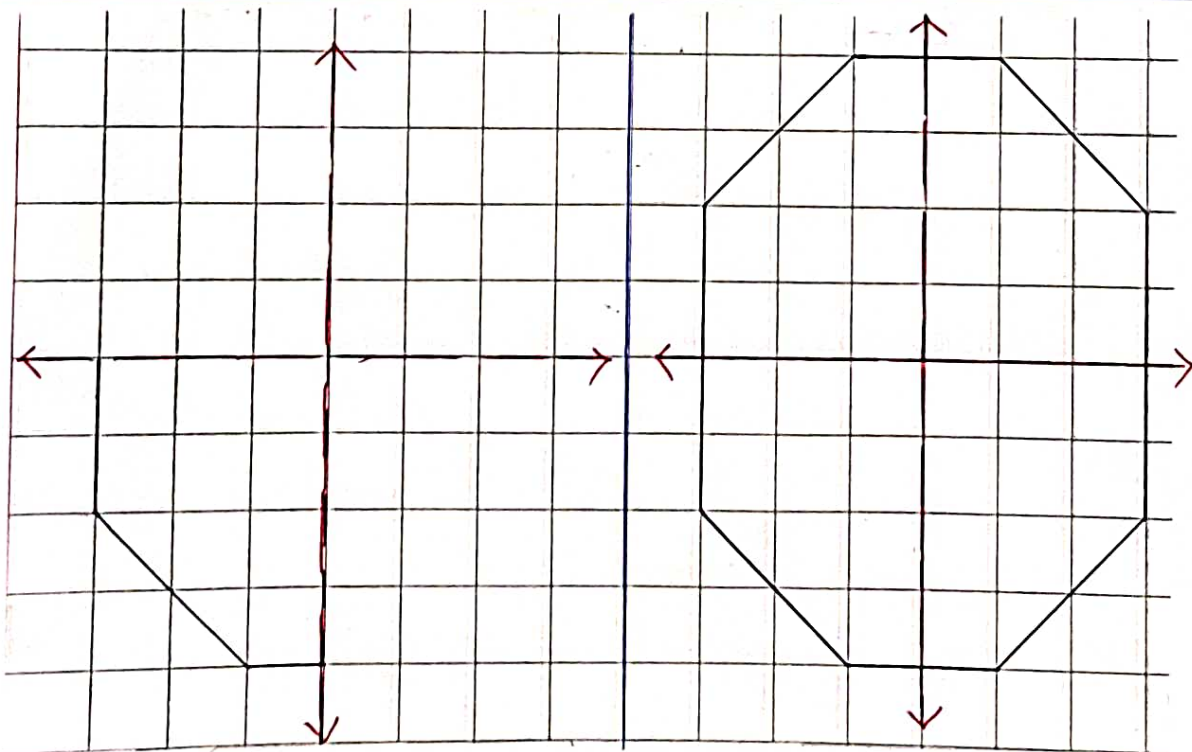


2

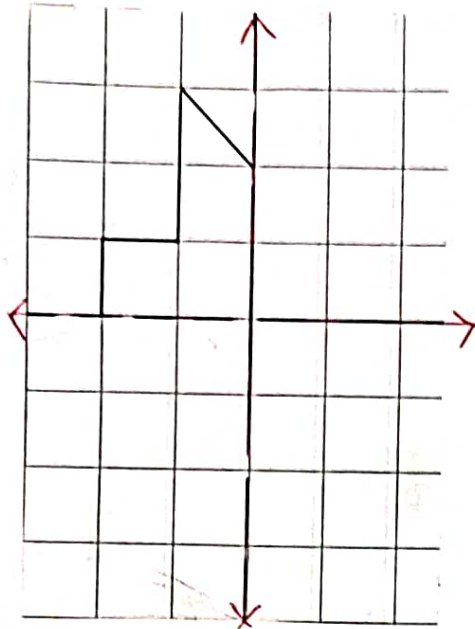
2 Copy the following drawing on squared paper. Complete each one of them such that resulting figure has the two dotted lines as two lines of symmetry:

(a)

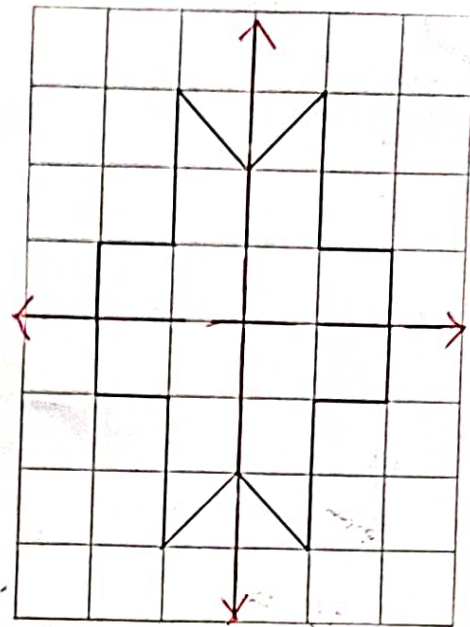




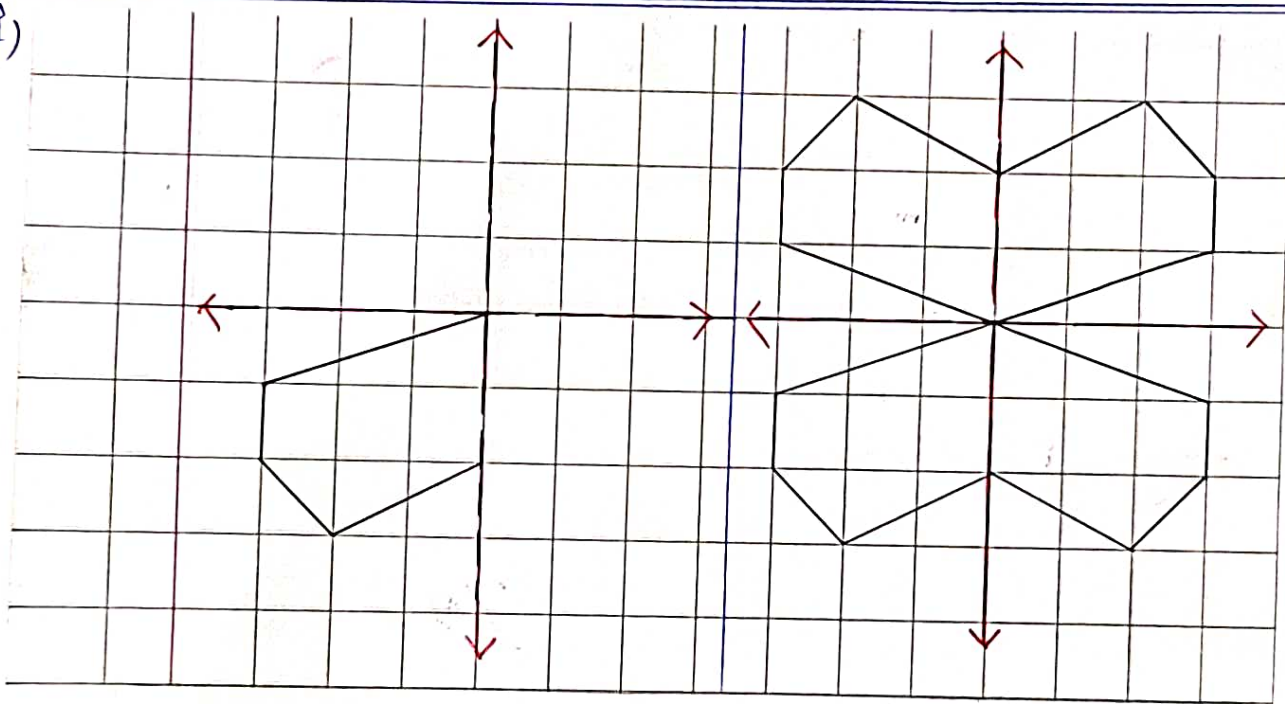
(e)



Soln.



(f)

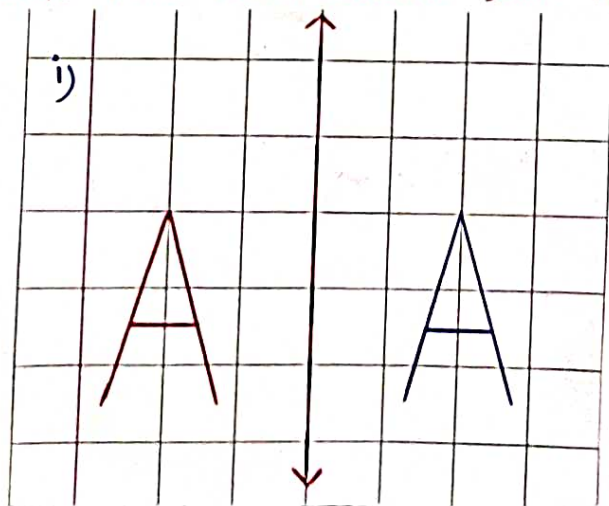


3 In each figure, a letter of alphabet is shown along with a vertical line. Take the mirror image of the letter in the given line. Find which letters look the same after

reflection:

Try for the letters
A, B, O, E, M,
N, P, H, L, T,
S, V, X

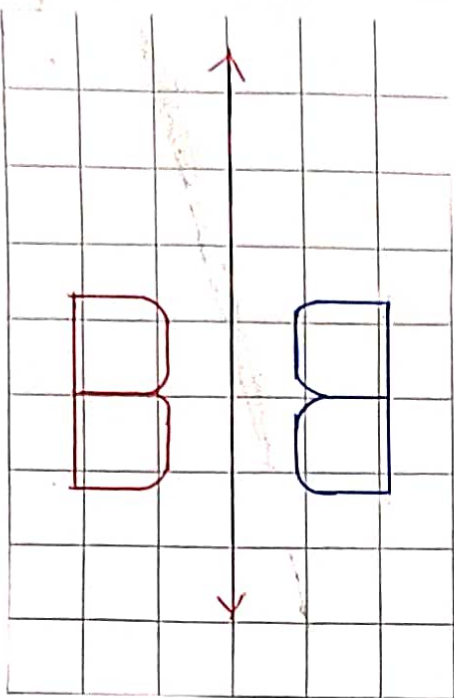
i)



Soln:

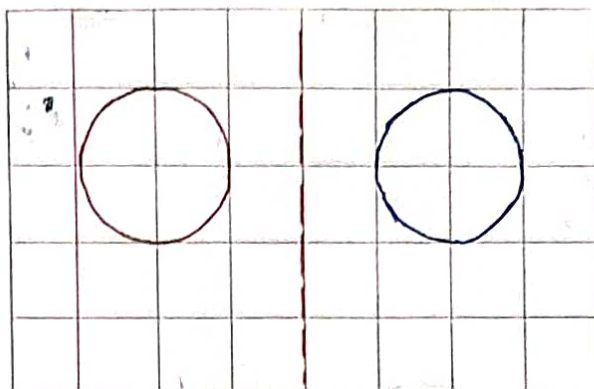
Same after
reflection

ii)



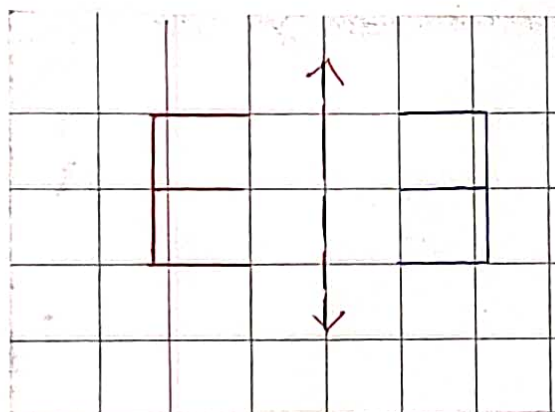
different after reflection

iii)



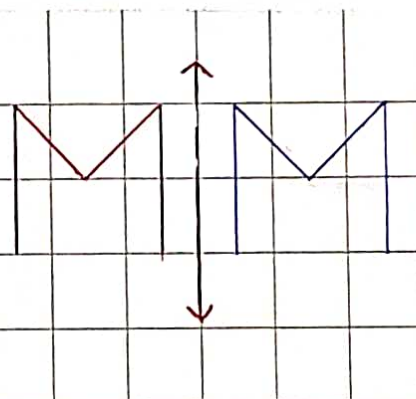
same after reflection

iv)



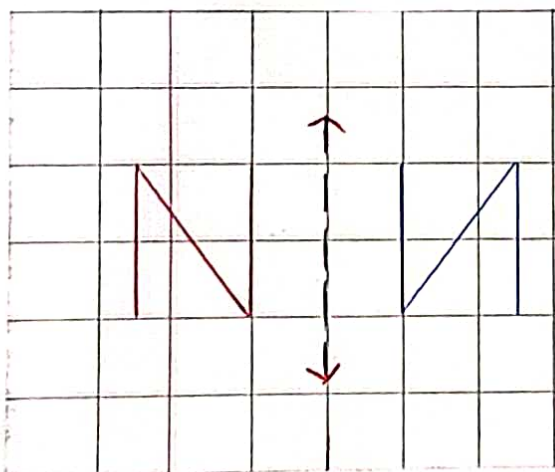
different after reflection

v)



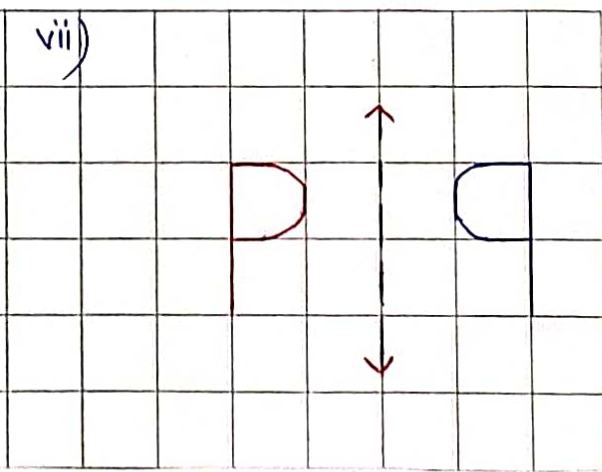
same after reflection

vi)



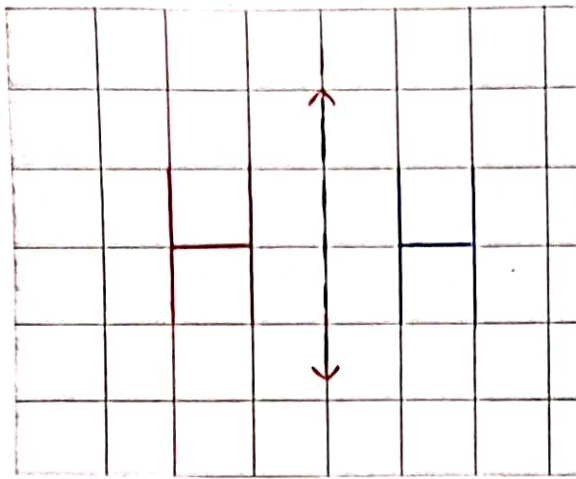
different after reflection

vii)



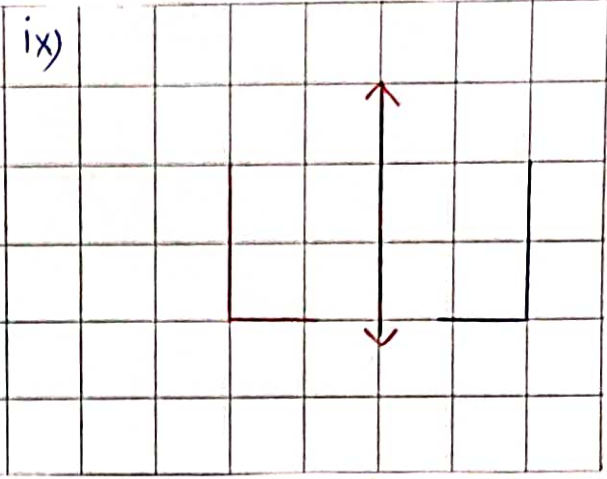
different after reflection

viii)



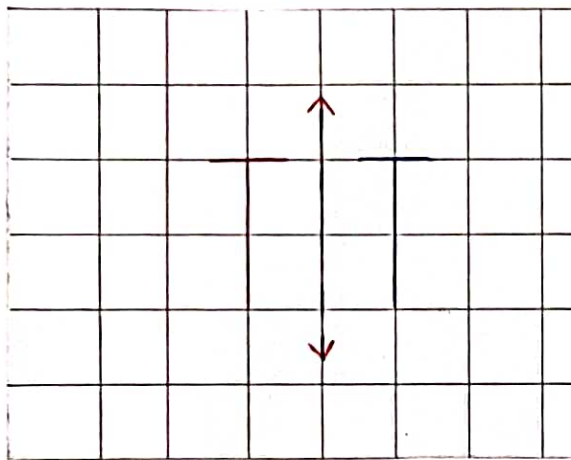
same after reflection

ix)



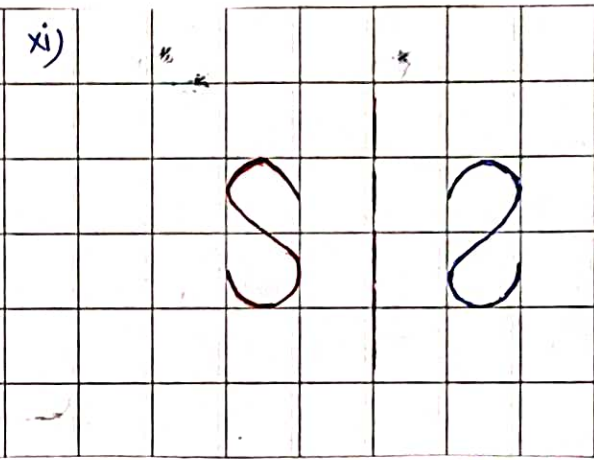
different after reflection

x)



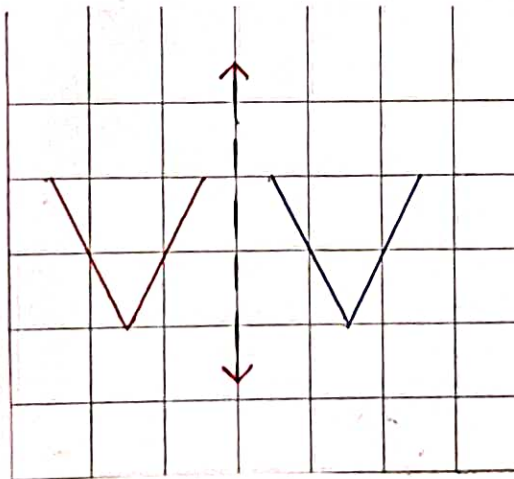
same after reflection

xi)



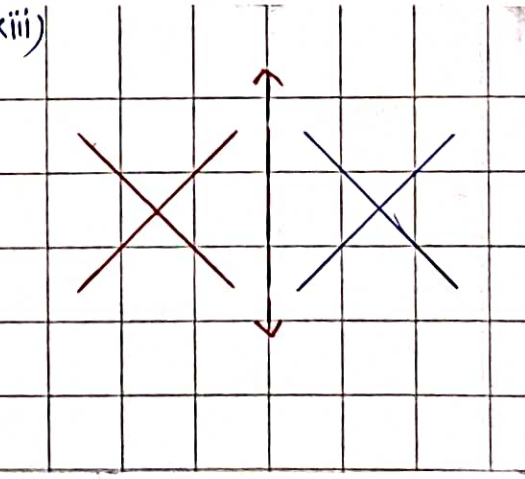
different after reflection

xii)



same after reflection

xiii)



same after reflection

ਗੁਰਪ੍ਰੀਤ ਸਿੰਘ (ਮੈਚ ਮਿਸਟਰ)
 ਮ.ਯ.ਸ. ਸਕੂਲ,
 ਜਲੰਧਰ।