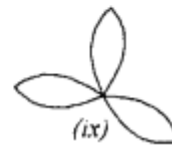
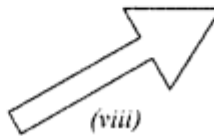
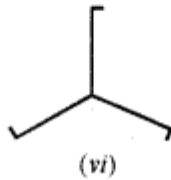
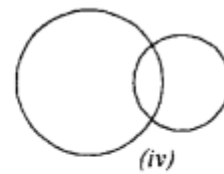
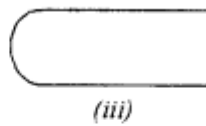
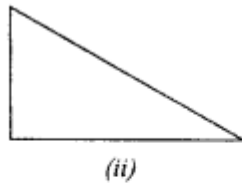


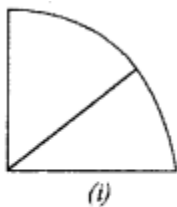
Chapter 12
Symmetry
Exercise 12.1

Question 1.

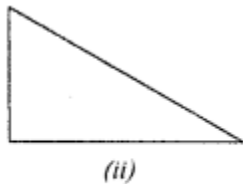
Draw the line (or lines) of symmetry, if any, of the following shapes and count their number.



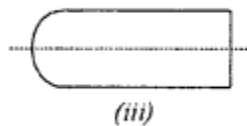
Solution:



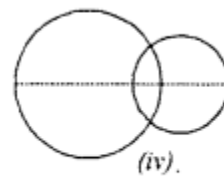
One line



None



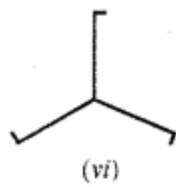
One line



One line



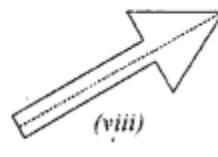
None



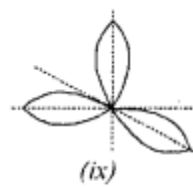
None



One



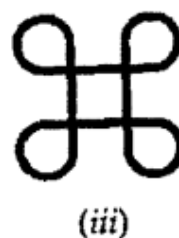
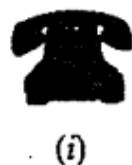
One



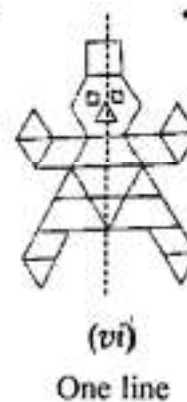
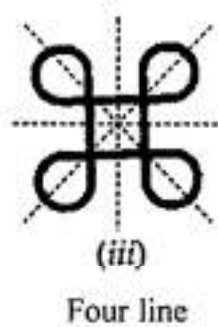
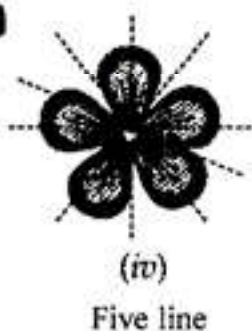
Three

Question 2.

Draw the line (or lines) of symmetry, if any, of the following pictures (of Objects) and count their number.

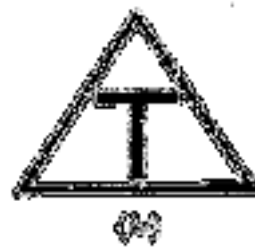


Solution:

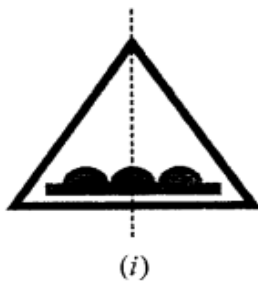


Question 3.

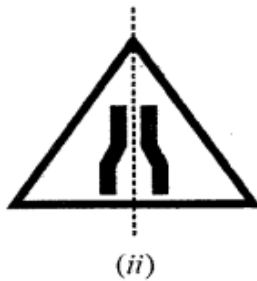
Draw the line (or lines) of symmetry, if any, of the following road signs and count their number :



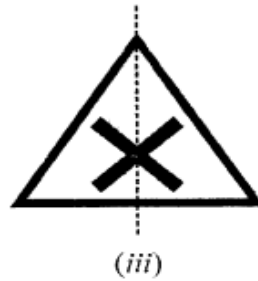
Solution:



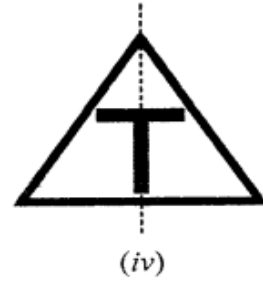
One line



One line



One line



One line

Question 4.

Draw the line (or lines) of symmetry, if any, of the following numerals and count their number :

(i) 3

(ii) 5

(iii) 6

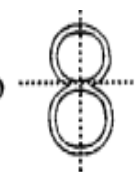
(iv) 8

Solution:

(i) one 

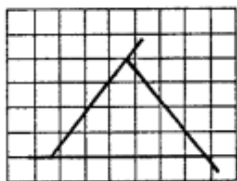
(ii) none

(iii) none

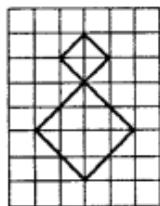
(iv) two 

Question 5.

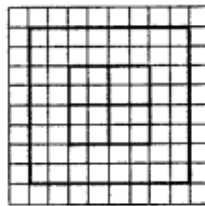
Copy the following figures on a squared paper and draw the lines of symmetry (if any) and count their number:



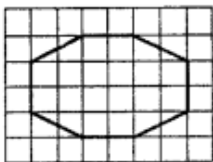
(i)



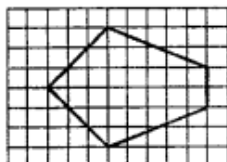
(ii)



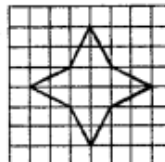
(iii)



(iv)

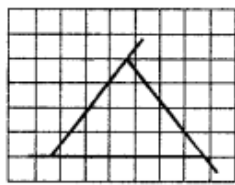


(v)

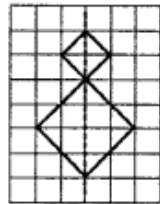


(vi)

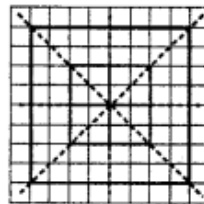
Solution:



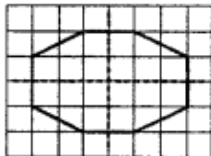
(i)
None



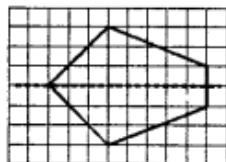
(ii)
One



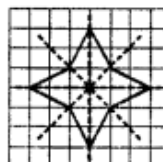
(iii)
Four



(iv)
Two



(v)
One



(vi)
Four

Question 6.

Write the letters of word 'JUST LOOK' which have no line of symmetry.

Solution;

The words which have no line of symmetry are : J, S, L and K.



The words which have One line of symmetry are :

Question 7.

Can you draw a triangle which has

- (i) exactly one line of symmetry ?
- (ii) exactly two lines of symmetry ?
- (iii) exactly three lines of symmetry ?
- (iv) no lines of symmetry ?

Sketch a rough figure in each case and name the triangle.

Solution:

(i) A isosceles triangle

(ii) No possible

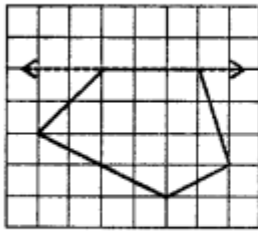
(iii) An equilateral triangle

(iv)  Scalene triangle

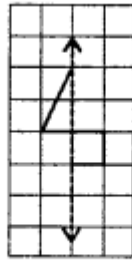
Exercise 12.2

Question 1.

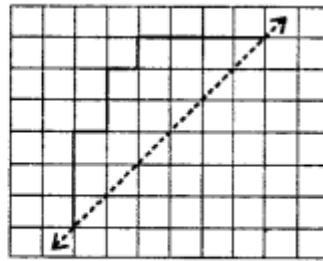
Copy the following figures on a squared paper. Complete each of them such that the dotted line is the line of symmetry:



(i)

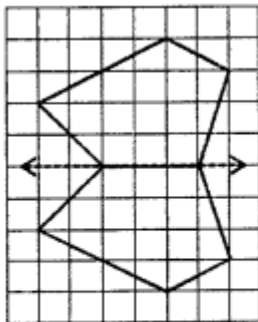


(ii)

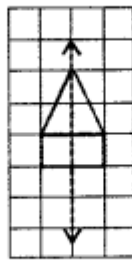


(iii)

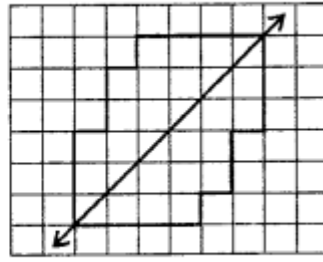
Solution;



(i)



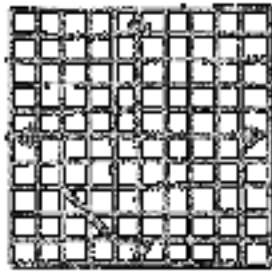
(ii)



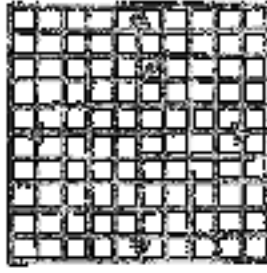
(iii)

Question 2.

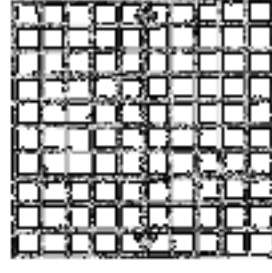
Copy the following figures on a squared paper. Complete each of them such that the resultant figure has two dotted lines as the lines of symmetry :



Q1

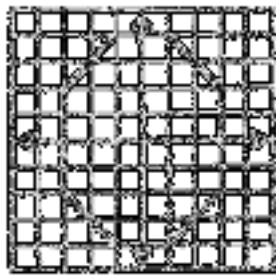


Q2

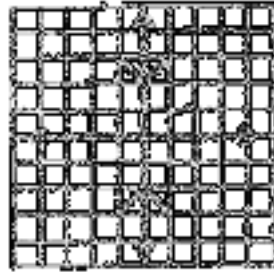


Q3

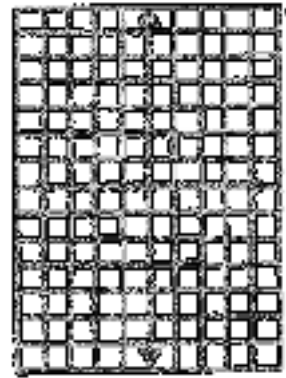
Solution:



Q1



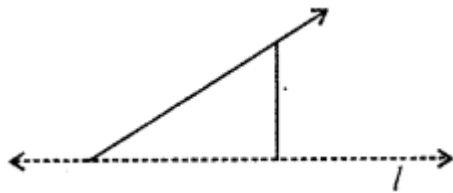
Q2



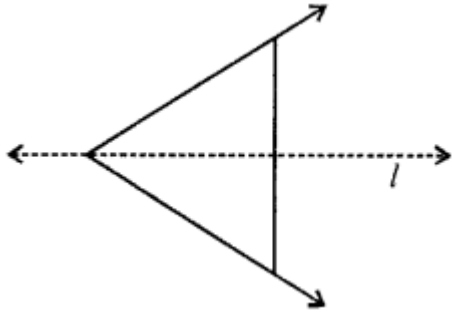
Q3

Question 3.

In the given figure, l is the line of symmetry. Complete the diagram to make it symmetrical.

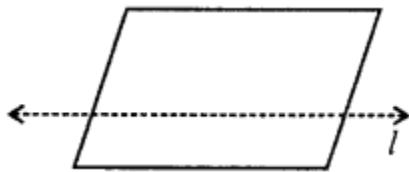


Solution:

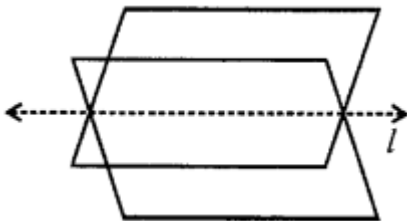


Question 4.

In the given figure, l is the line of symmetry, Draw the image of the parallelogram and complete the diagram so that it becomes symmetrical.

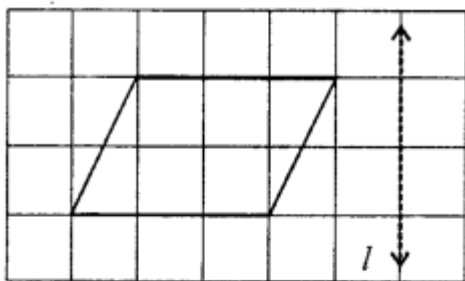


Solution:

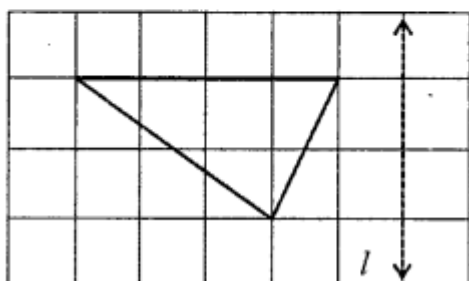


Question 5.

Copy the following figures on a squared paper and find their reflections in the mirror line l .

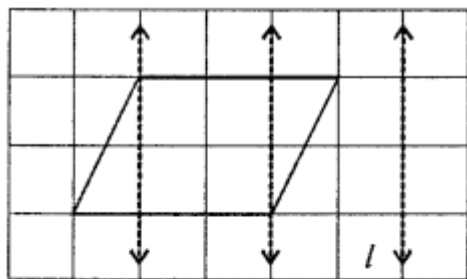


(i)

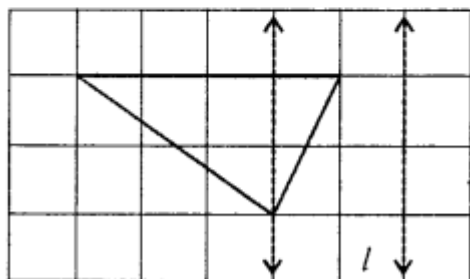


(ii)

Solution:



(i)



(ii)

Objective Type Questions

Mental Maths

Question 1.

Fill in the blanks:

- (i) The subtraction symbol $-$ haslines of symmetry.
- (ii) The addition symbol $+$ has..... lines ofsymmetry.
- (iii) Line of symmetry is also knownline orof symmetry.
- (iv) A kite has.....line(s) of symmetry.
- (v) A parallelogram has..... line(s) of symmetry.
- (vi) The number of lines of symmetry in a regular hexagon is
- (vii) A rectangle is symmetrical about the lines joining theof the opposite sides.
- (viii) The number of capital letters of the English alphabet having only vertical line of symmetry is.....
- (ix) The number of capital letters of the English alphabet having only horizontal line of symmetry is.....
- (x) The number of capital letters of the English alphabet having only horizontal line of symmetry is.....
- (xi) The digits having two lines of symmetry are.....and.....

Solution:

- (i) The subtraction symbol $-$ has **two** lines of symmetry.
- (ii) The addition symbol $+$ has **four** lines of symmetry.
- (iii) Line of symmetry is also known **mirror** line or **axis** of symmetry.

- (iv) A kite has **one** line(s) of symmetry.
- (v) A parallelogram has **no** line(s) of symmetry.
- (vi) The number of lines of symmetry in a regular hexagon is **6**.
- (vii) A rectangle is symmetrical about the lines joining the **mid-points** of the opposite sides.
- (viii) The number of capital letters of the English alphabet having only vertical line of symmetry is **7**.
- (ix) The number of capital letters of the English alphabet having only horizontal line of symmetry is **4**.
- (x) The number of capital letters of the English alphabet having only horizontal line of symmetry is **4**.
- (xi) The digits having two lines of symmetry are 0 and 8.

Question 2.

State whether the following statement are true (T) or false (F):

- (i) The letter N has one line of symmetry.
- (ii) Every hexagon has six lines of symmetry.
- (iii) All right angled triangles have one line of symmetry.
- (iv) A triangle with more than one line of symmetry must be an equilateral triangle.
- (v) A triangle with more than one line of symmetry must be an equilateral triangle.
- (vi) A circle has only 8 lines of symmetry.
- (vii) A regular Octagon has 10 lines of symmetry.
- (viii) A square and a rectangle have the same number of lines of symmetry.

- (ix) A right angles triangle can have the same number of lines of symmetry.
- (x) If an isosceles triangle has more than one line of symmetry, then it must be an equilateral triangle.
- (xi) If a rectangle has more than two lines of symmetry, then it must be a square.

Solution:

- (i) The letter N has one line of symmetry. **False**
- (ii) Every hexagon has six lines of symmetry. **False**
- (iii) All right angled triangles have one line of symmetry. **False**
- (iv) A triangle with more than one line of symmetry must be an equilateral triangle. **True**
- (v) A triangle with more than one line of symmetry must be an equilateral triangle. **True**
- (vi) A circle has only 8 lines of symmetry. **False**
- (vii) A regular Octagon has 10 lines of symmetry. **False**
- (viii) A square and a rectangle have the same number of lines of symmetry. **False**
- (ix) A right angles triangle can have the same number of lines of symmetry. **True**
- (x) If an isosceles triangle has more than one line of symmetry, then it must be an equilateral triangle. **True**
- (xi) If a rectangle has more than two lines of symmetry, then it must be a square. **True**

Multiple Choice Questions

Choose the correct answer from the given four Options (3 to 15):

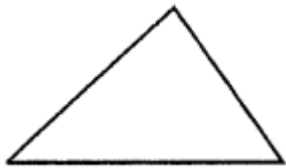
Question 3.

The number of lines of symmetry of a scalene triangle is

- (a) 0
- (b) 1
- (c) 2
- (d) 3

Solution:

- (a) 0



Question 4.

The letter F has

- (a) One horizon line of symmetry
- (b) one vertical line of symmetry
- (c) Two lines of symmetry
- (d) no line of symmetry

Solution:

(d) no line of symmetry

Question 5.

The number of lines of symmetry of a rectangle is

(a) 0

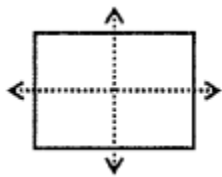
(b) 1

(c) 2

(d) 4

Solution:

2 (c)



Question 6

A rhombus is symmetrical about

(a) each of its two diagonals

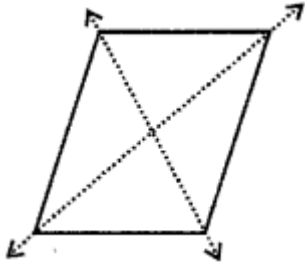
(b) each of its two lines joining the mid-points of opposite sides

(c) each of the perpendicular bisectors of its sides

(d) none of these.

Solution:

(a) each of its two diagonals



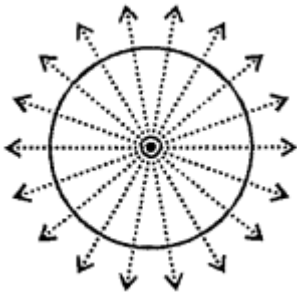
Question 7.

The number of lines of symmetry of a circle is

- (a) 4
- (b) 8
- (c) 16
- (d) unlimited

Solution:

- (d) unlimited



Question 8.

Which of the following letters does not have any line of symmetry?

- (a) B
- (b) T
- (c) Z
- (d) Y

Solution:

- (c) Z

Question 9.

Which of the following letters does not have the vertical line of symmetry?

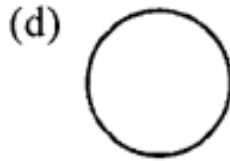
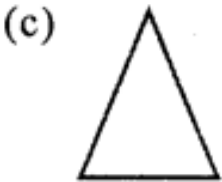
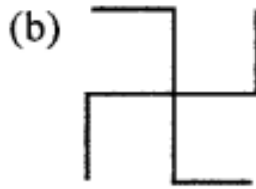
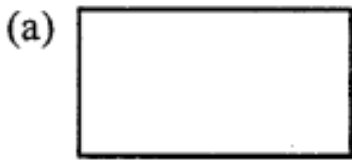
- (a) A
- (b) H
- (c) M
- (d) E

Solution:

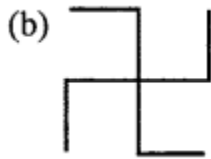
E, because has horizontal line of symmetry. (d)

Question 10.

Which figure from the following figures is not symmetrical with respect to any line ?

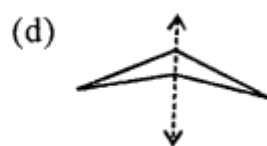
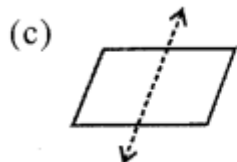
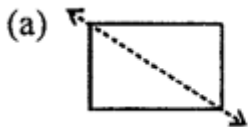


Solution:

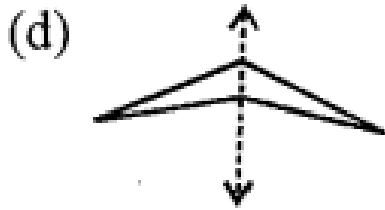


Question 11.

In which of the given figures is the dotted line of symmetry ?

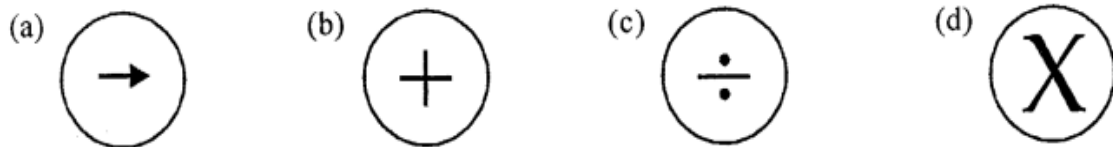


Solution:

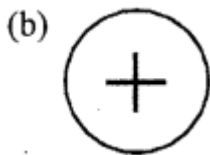


Question 12.

Amongst the given figures, the one having maximum number of lines of symmetry is :



Solution:



Question 13.

The angle between the mirror line and the line segment joining a point and its reflection (image) is :

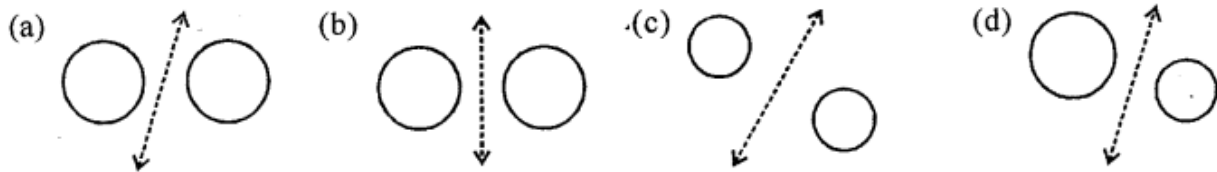
- (a) 0°
- (b) 45°
- (c) 60°
- (d) 90°

Solution:

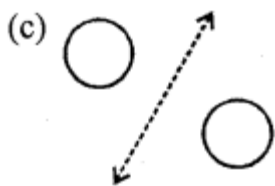
(d) 90°

Question 14.

Which of two figures are image of each other (mirror line shown dotted) ?

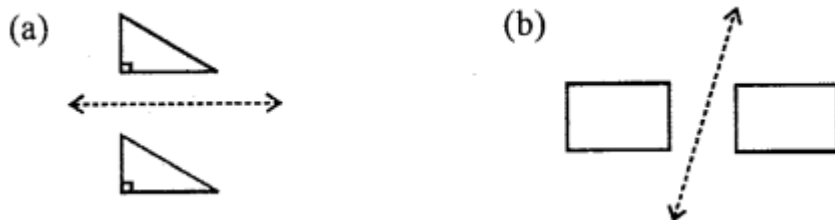


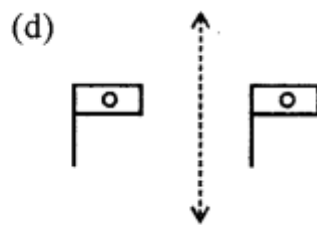
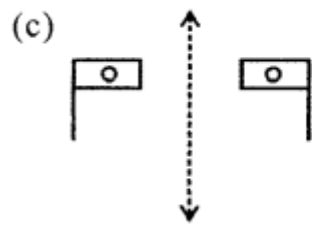
Solution:



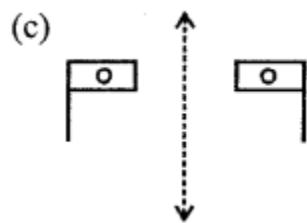
Question 15.

Which of the two figures are mirror images of each other (mirror line shown dotted) ?





Solution:



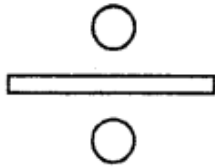
Check Your Progress

Question 1.

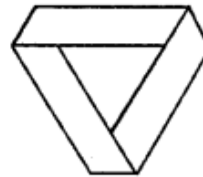
Draw the line (or lines) of symmetry, if any, of the following figures, shapes and count their number :



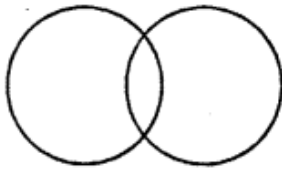
(i)



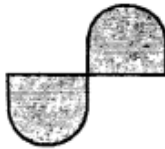
(ii)



(iii)



(iv)



(v)



(vi)



(vii)

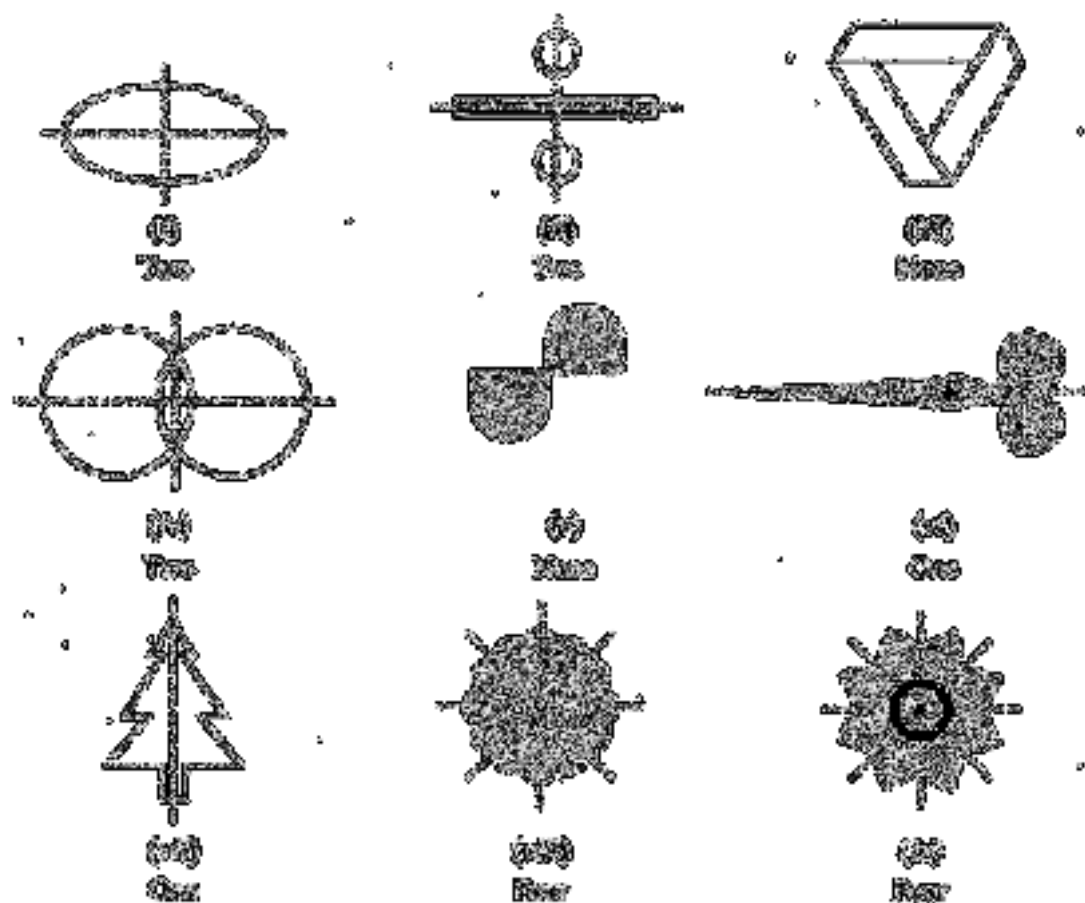


(viii)



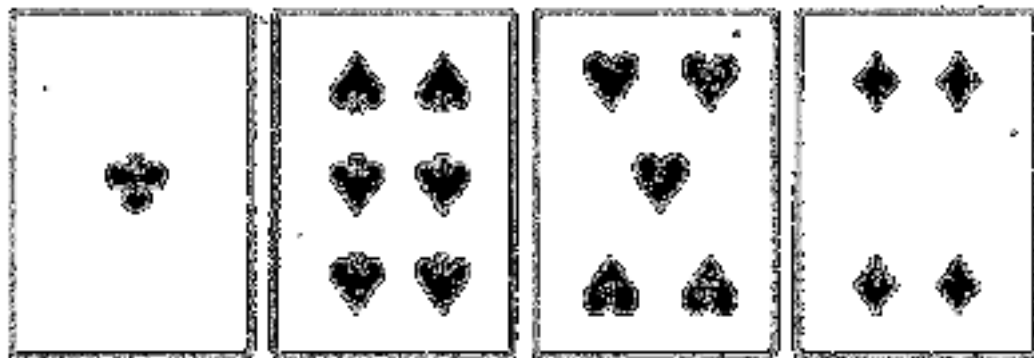
(ix)

Solution:

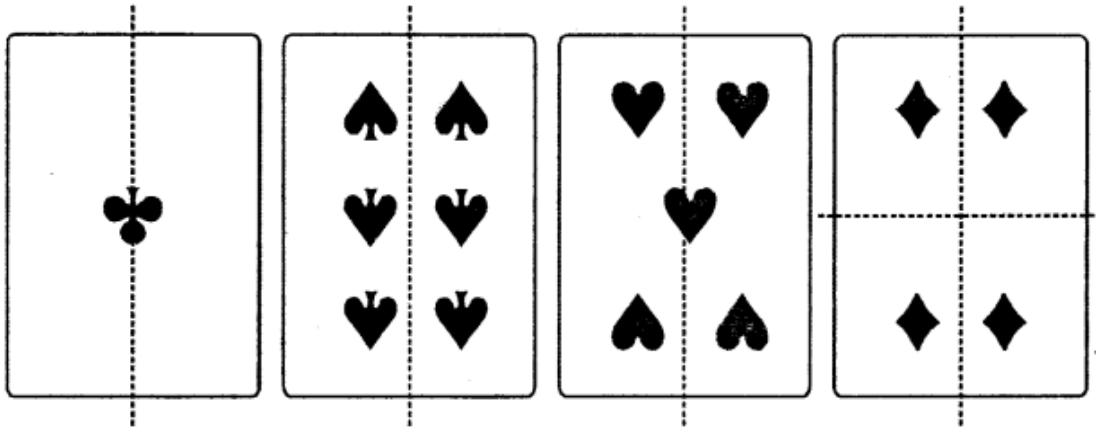


Question 2.

Draw the line (or lines) of symmetry, if any, of the following pictures of playing cards and count their number:



Solution:



Question 3.

Write the letters of the word 'ALGEBRA' which have no line of symmetry.

Solution:

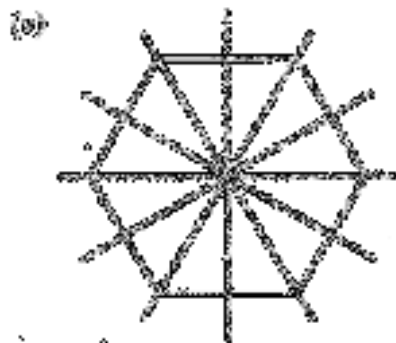
L, G, R

Question 4.

On a squared paper, sketch the following:

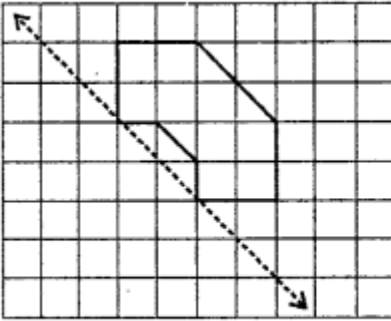
- (I) A triangle with a horizontal line of symmetry but no vertical line of symmetry.
- (ii) A quadrilateral with both horizontal and vertical lines of symmetry.
- (iii) A quadrilateral with a horizontal line of symmetry but no vertical line of symmetry.
- (iv) A hexagon with exactly two line of symmetry.

Solution:

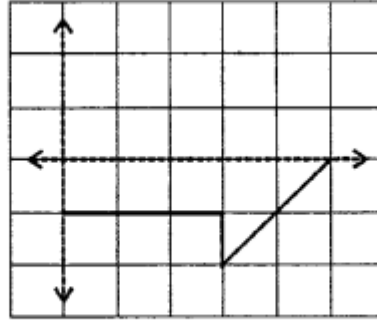


Question 5.

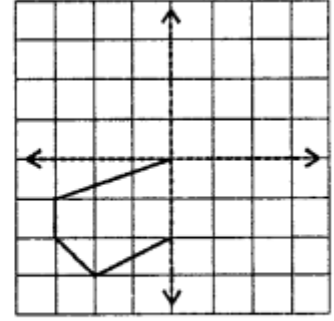
Copy the following figures on a squared paper and complete each figure such that the resultant figure is symmetrical about the dotted line (or lines):



(i)

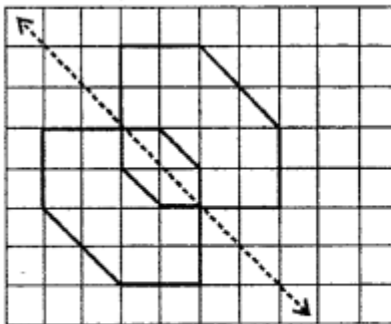


(ii)

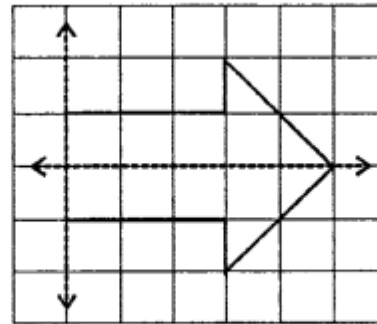


(iii)

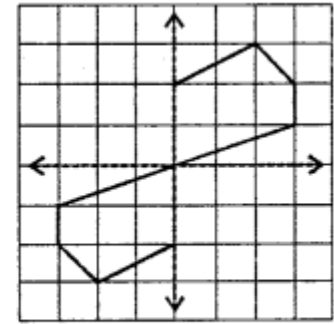
Solution:



(i)



(ii)



(iii)

Question 6.

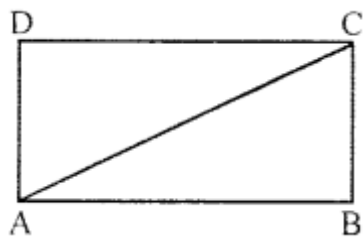
State whether the following statement is true or false. Justify your answer :

“ A straight line dividing a figure into two identical parts is necessarily a line of symmetry.”

Solution:

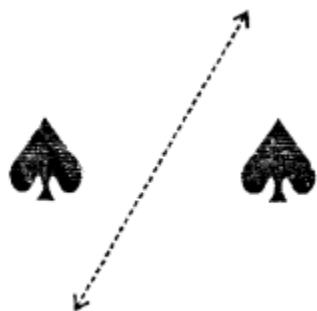
False, in the figure shown,

Diagonals AC divides the rectangle into two identical parts but rectangle is not symmetrical about line $\overleftrightarrow{AC}$.



Question 7.

Find whether the figure on the left side is the reflection of the figures on right side. If not, draw the correct figure.



Solution:

NO

