Non – Verbal Reasoning

Learning Objectives

- To get aware of non-verbal reasoning.
- Increasing interest about this segment of reasoning.
- To understand the logic of figures.
- To be perfect in solving figure based problems.

What is Non Verbal Reasoning?

Non verbal reasoning is a figure based reasoning. It has no language at all. To solve non-verbal problems one has to find out the pattern of pictorial presentation in the given figure. To get more clear concept about non verbal reasoning, let us see the types of problems coming before you.

Types of Problems

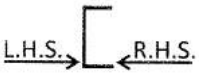
(a) Problems Based on Mirror Image

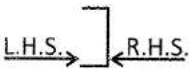
In a mirror image, left part of an object becomes right part and right part becomes left part. Remember the rule given below.

Left Hand Side (L.H.S.) $\rightleftarrows$ Right Hand Side (R.H.S.)

Example 2:	**Actual Figure**	**Mirror Image**
(i)		
(ii)		
(iii)		
(iv)		

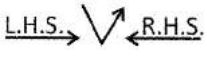
Explanation:

(i) **Actual Figure:** 

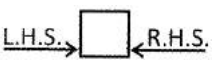
Mirror Image: 

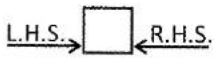
Clearly, L.H.S. becomes R.H.S. and R.H.S. becomes L.H.S.

(ii) **Actual Figure**: 

Mirror Image: 

Clearly, L.H.S. becomes R.H.S. and R.H.S. becomes L.H.S.

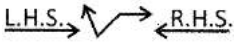
(iii) **Actual Figure:** 

Mirror Image: 

In this case, the actual figure and its mirror image both will be same because there is no difference in the L.H.S. and the R.H.S. sides of the figure. Hence, in actual sense, the L.H.S. does become the R.H.S. and the R.H.S. does become the L.H.S., but this change does not appear to you. Therefore, remember the following rule.

Rule X = If "**L.H.S. = R.H.S',** then mirror image and the actual figure will be similar.

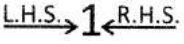
(iv) **Actual Figure:** 

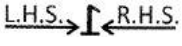
Mirror Image: 

Clearly, L.H.S. becomes R.H.S. and R.H.S. becomes L.H.S.

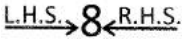
Example 2:	**Actual Figure**	**Mirror Image**
(i)	1	1
(ii)	8	8
(iii)	B	B
(iv)	A	A
(v)	4	4
(vi)	G	G

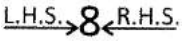
Explanation:

(i) Actual Figure: 

Mirror Image: 

Clearly, L.H.S. becomes R.H.S. and R.H.S. becomes L.H.S.

(ii) Actual Figure: 

Mirror Image: 

Here,

L.H.S. = R.H.S. **(See Rule X)**

∴ Actual figure and Mirror image are same.

(iii) Actual Figure: 

Mirror Image: 

Clearly, L.H.S. becomes R.H.S. and R.H.S. becomes L.H.S.

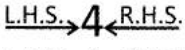
(iv) Actual Figure: 

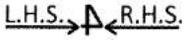
Mirror Image: 

Here,

L.H.S. = R.H.S. **(See Rule X)**

∴ Actual figure and Mirror image will be similar.

(v) Actual Figure: 

Mirror Image: 

Clearly, L.H.S. becomes R.H.S. and R.H.S. becomes L.H.S.

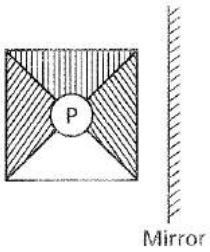
(vi) Actual Figure: 

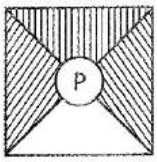
Mirror Image: 

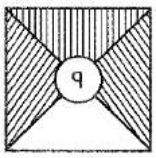
Clearly, L.H.S. becomes R.H.S. and R.H.S. becomes L.H.S.

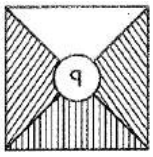
Commonly Asked Question

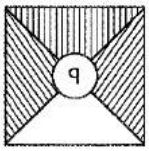
1. Find the mirror image of the given figure:



(a) 

(b) 

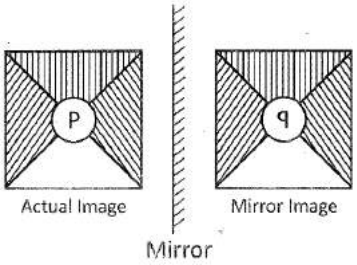
(c) 

(d) 

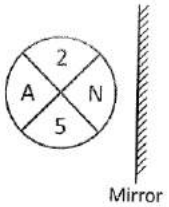
(e) None of these

Answer: (b)

Explanation: Mirror Image is as follow:



2. Find the mirror image of the given figure:



(a) 

(b) 

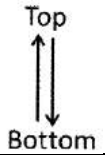
(c) 

(d) 

(e) None of these

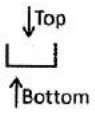
Answer: (c)
Explanation: Mirror image is as follows:

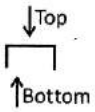
(b) Problems Based on Water Image.
In water image, the actual figure gets inverted vertically. In other words, in water image top becomes bottom and bottom becomes top but there is no change in LH.S. and R.H.S. like mirror image. LH.S. remains L.H.S. and R.H.S. remains R.H.S.
Remember the rule given below.



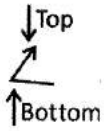
Example 1:	**Actual figure**	**Water Image**
(i)		
(ii)		
(iii)		
(iv)		

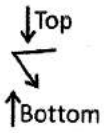
Explanation:

(i) **Actual Figure:** 

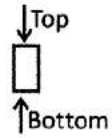
Water Image: 

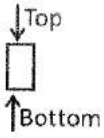
Clearly, top becomes bottom and bottom becomes top.

(ii) **Actual Figure:** 

Water Image: 

Clearly, top becomes bottom and bottom becomes top.

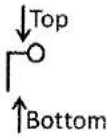
(iii) **Actual Figure:** 

Water Image: 

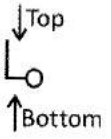
In this case, the actual figure and its water image both will be same because there is no difference in the top and the bottom parts of the actual figure. Therefore, in actual sense, the top does become the bottom and the bottom does become the top, but this change does not appear to you. Therefore, remember the following rule:

Rule Y | If **'Top = Bottom'**, then water image and the actual figure will be similar.

(iv) **Actual Figure:**



Water Image:

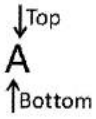


Clearly, top becomes bottom and bottom becomes top.

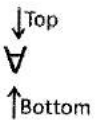
Example 2:	**Actual Figure**	**Water Image**
(i)	A	∀
(ii)	9	ə
(iii)	3	Ɜ
(iv)	M	W
(v)	H	H

Explanation:

(i) **Actual Figure:**

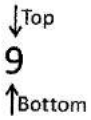


Water Image:

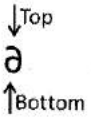


Clearly, top becomes bottom and bottom becomes top.

(ii) **Actual Figure:**

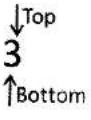


Water Image:



Clearly, top becomes bottom and bottom becomes top.

(iii) **Actual Figure:**

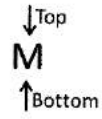


Water Image:

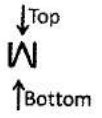
Here, Top = Bottom **(See Rule: Y)**

∴ Actual figure and water images will be similar.

(iv) **Actual Figure:**

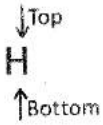


Water Image:

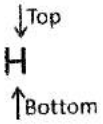


Clearly, top becomes bottom and bottom becomes top.

(v) **Actual Figure:**



Water Image:

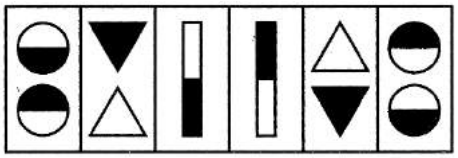


Here, Top = Bottom **(See Rule: Y)**

∴ Actual figure and water image will be similar.

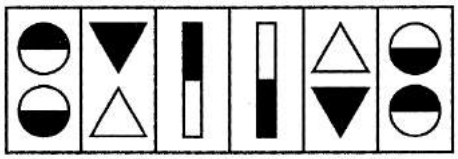
Commonly Asked Question

5. Find the water image of the given figure.

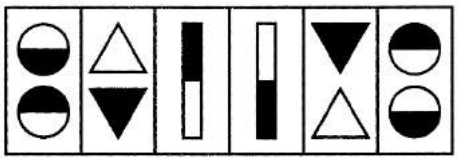


_____ Water

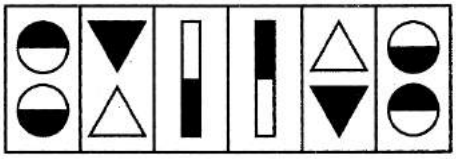
(a)



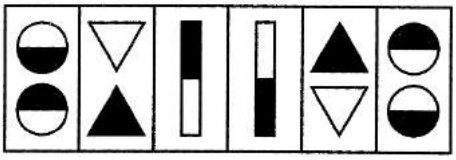
(b)



(c)



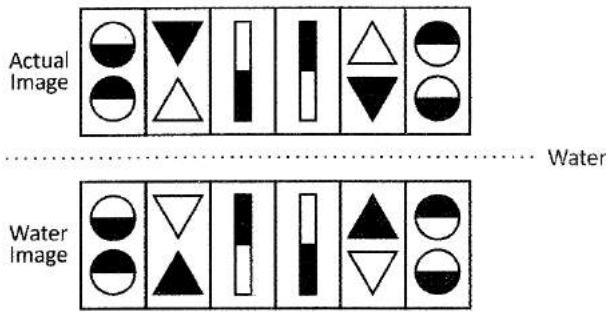
(d)



(e) None of these

Answer (d)

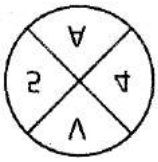
Explanation: Water Image is as follow:.



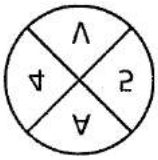
8. Find the water image of the given figure.

Water

(a) 

(b) 

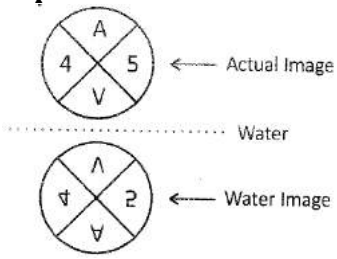
(c) 

(d) 

(e) None of these

Answer: (d)

Explanation:



(c) Problems Based on Geometrical Shapes

Geometrical shapes come from geometry which is the math of shapes made of points and lines. Some shapes are simple such as a triangle, square and circle, whereas other shapes are complex. While solving reasoning based on geometrical shapes, following points are important:

Rotation: Turning of any figure around a point is called rotation.

(i) Two half rotations mean one full rotation.

(ii) Rotation means figure rotates 90° clockwise or 90° anticlockwise.

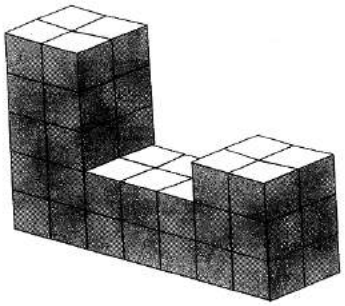
(iii) Rotation means figure rotates 45° clockwise or 45° anticlockwise.

Counting Geometrical Shapes: In order to count the geometrical shapes, we identify the shapes and solids by their names and images.

Embedded Figures: If a figure contains another figure as its parts, the figure part is called embedded figure.

- **Example:**

1. For a cube  , how many cubes are there in the figure given below?



(a) 44 (b) 48
(c) 46 (d) 52
(e) None of these

Answer: (a)

Explanation: Number of cubes in first layer = 14
Number of cubes in second layer = 14
Number of cubes in third layer = 8
Number of cubes in fourth layer = 4
Number of cubes in fifth layer = 4
Total number of cubes = 14 + 14 + 8 + 4 + 4 = 44

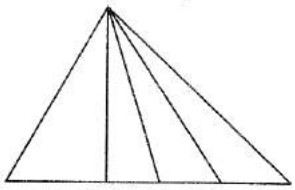
2. For a cube  , how many cubes are there in the figure given below?

(a) 26 (b) 22
(c) 24 (d) 20
(e) None of these

Answer (b)

Explanation: Number of cubes in first layer = 7
Number of cubes in second layer = 5
Number of cubes in third layer = 4
Number of cubes in fourth layer = 3
Number of cubes in fifth layer = 3
Total number of cubes = 7 + 5 + 4 + 3 + 3 = 22

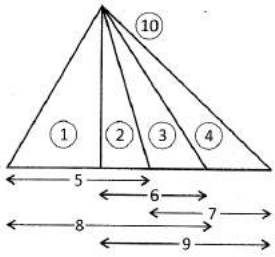
3. How many triangles are there in the figure given below?



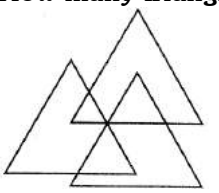
(a) 8 (b) 10
(c) 12 (d) 14
(e) None of these

Answer: (b)

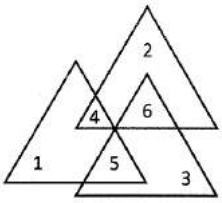
Explanation: Clearly, there are 10 triangles in the given figure.



4. How many triangles are there in the figure given below.

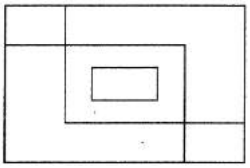


(a) 8 (b) 5
(c) 7 (d) 6
(e) None of these
Answer (d)
Explanation:

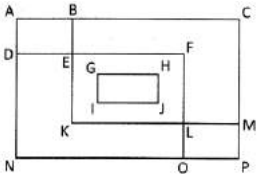


Clearly, there are 6 triangles in the figure given above.

5. How many rectangles are there in the given figure?

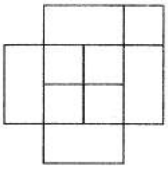


(a) 5 (b) 6
(c) 7 (d) 8
(e) None of these
Answer (c)
Explanation:

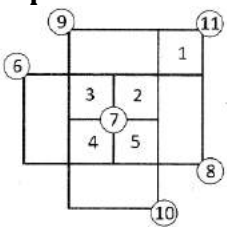


Rectangles are: ACPN, DFOIM, BKMC, ADEB, EKLF, 61JH and LOPM. So, there are 7 rectangles in the given figure.

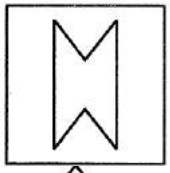
6. How many squares are there in the given figure?

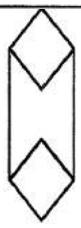


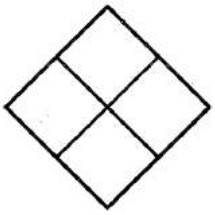
(a) 10 (b) 11
(c) 12 (d) 13
(e) None of these
Answer (b)
Explanation: Clearly, there are 11 squares in the given figure above.



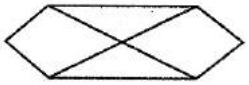
7. Find out the alternative figure which contains Figure (X) given below as its part.



(a) 

(b) 

(c) 

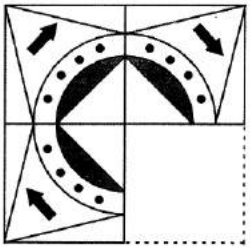
(d) 

(e) None of these

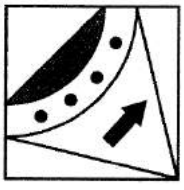
Answer: (a)

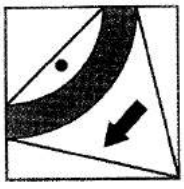
Explanation: Clearly, figure given in option (a) contains the figure given in question.

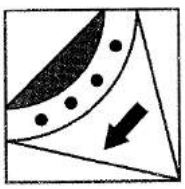
8. Which one of the following figure parts would complete the figure given below?



(a) 

(b) 

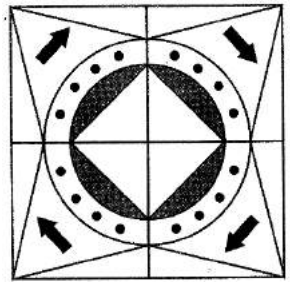
(c) 

(d) 

(e) None of these

Answer: (d)

Explanation: The complete figure is as follows:



Therefore, the missing part is given in option (d).

Commonly Asked Question

1. What is the water image of the figure in the box?

(a) 

(b) 

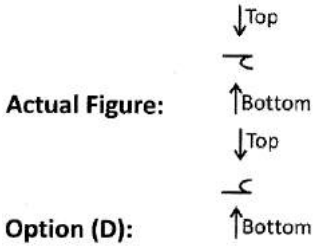
(c) 

(d) 

(e) None of these

Answer: (d)

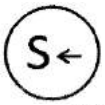
Explanation: Option (d) is correct because it is vertically inverted figure of the actual figure. Let us see:

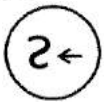


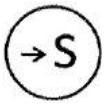
Clearly, top of the actual figure becomes the bottom of option (d) and the bottom of the actual figure becomes the top of the option (d).

Rest of the options is incorrect because of the correctness of option (d).

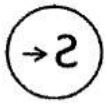
2. What is the mirror image of the figure given inside the circle?



(a) 

(b) 

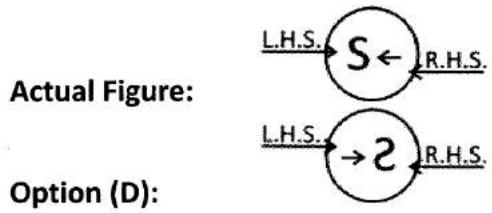
(c) 

(d) 

(e) None of these

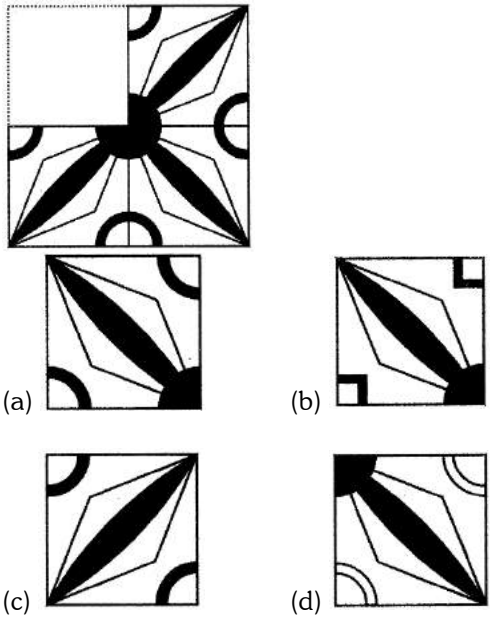
Answer: (d)

Explanation: Option (d) is correct because in option (d) L.H.S. is the R.H.S. of the actual figure and R.H.S. is the L.H.S. of the actual figure. Let us see:



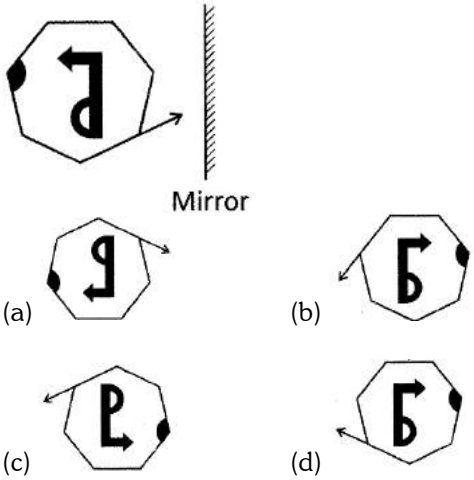
Option (d):
Clearly, option (d) is the mirror image of the actual figure.
Rest of the options is incorrect because of the correctness of option (d).

3. Select a figure from the given four options, which when placed in the blank space of the given figure would complete the pattern.



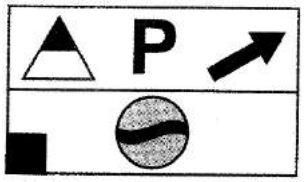
(e) None of these
Answer: (a)

4. Find the mirror image.

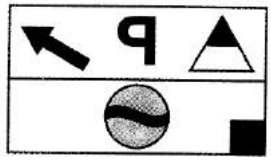


(e) None of these
Answer: (d)

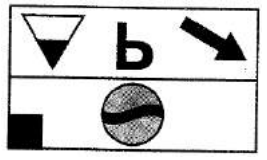
5. Find the water image of the following:



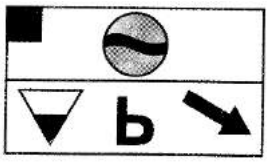
(a)



(b)



(c)

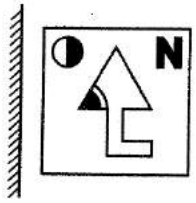


(d)

(e) None of these

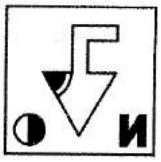
Answer: (c)

6. Find the mirror image.

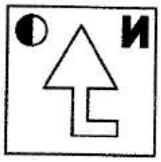


Mirror

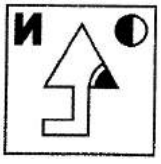
(a)



(b)



(c)

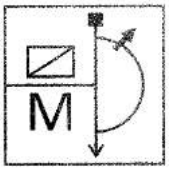


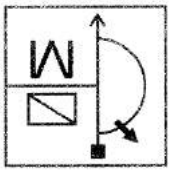
(d)

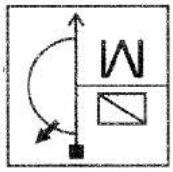
(e) None of these

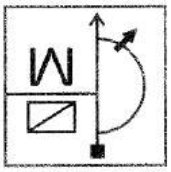
Answer: (c)

7. Find the water image.

(a) 

(b) 

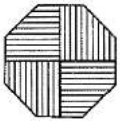
(c) 

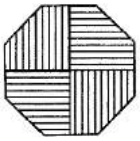
(d) 

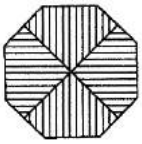
(e) None of these

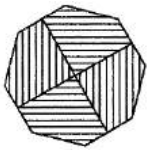
Answer: (b)

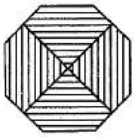
8. Find the water image of the following figure



(a) 

(b) 

(c) 

(d) 

(e) None of these

Answer: (a)

9. The given shape is rotated in anticlockwise direction, which of the following shapes is the correct view after $5\frac{3}{4}$ rotation?

(a) 

(b) 

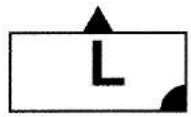
(c) 

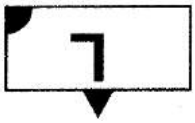
(d) 

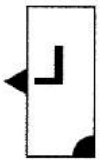
(e) None of these

Answer: (b)

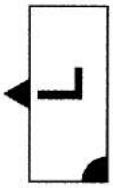
10. Find the view of the given figure after rotating $5\frac{3}{4}$ turn anticlockwise



(a) 

(b) 

(c) 

(d) 

(e) None of these

Answer: (c).