

**Learning objectives**

7.1 Symmetry

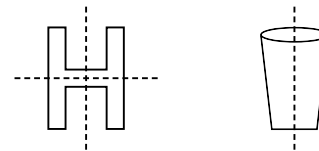
**7.1 SYMMETRY**

An object is said to be symmetrical, if its one half is the mirror image of the other half.

**Line of Symmetry**

The line which divides an object or shape into two halves is the line of symmetry.

For example :



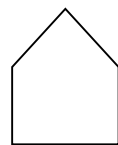
Some geometrical shapes and their line of symmetry are as follows :

<b>Geometrical shapes</b>			
<b>Number of lines of symmetry</b>	1	4	2

**SELF TEST - 1**

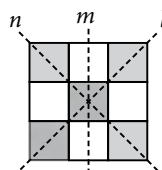
1. How many lines of symmetry does the given figure have?

- (A) 2 (B) 1  
(C) 4 (D) 5



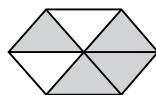
2. Which of the following is the line of symmetry for the given figure?

- (A) *l* (B) *m*  
(C) *n*  
(D) All of these



3. There are \_\_\_\_ lines of symmetry in the given figure.

- (A) 0 (B) 1  
(C) 2 (D) 3

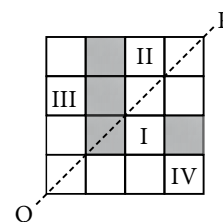


4. How many of the following letters do not have any line of symmetry?



- (A) 1 (B) 2  
(C) 3 (D) None of these

5. Which of the following squares must be shaded so that the given figure has PQ as line of symmetry?

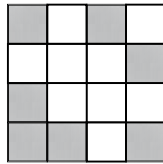


- (A) I (B) III  
(C) II (D) IV

# EXERCISE

1. How many lines of symmetry does the given figure have?

- (A) 1
- (B) 2
- (C) 3
- (D) 4

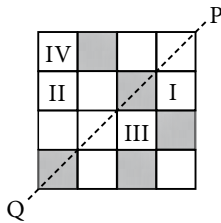


2. How many of the following letters do not have any line of symmetry?



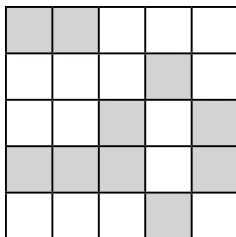
- (A) 1
- (B) 2
- (C) 3
- (D) 4

3. Which square must be shaded so that the given figure has PQ as a line of symmetry?



- (A) I
- (B) II
- (C) III
- (D) IV

4. How many lines of symmetry does the given figure have?



- (A) 0
- (B) 1
- (C) 2
- (D) 4

5. How many of the following digits have atleast one line of symmetry?

- (A) 4
- (B) 1
- (C) 3
- (D) 2

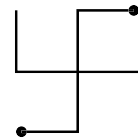
6. A square has \_\_\_\_\_ lines of symmetry.

- (A) 4
- (B) 2
- (C) 3
- (D) 0

7. Which of the following letters has atleast one line of symmetry?

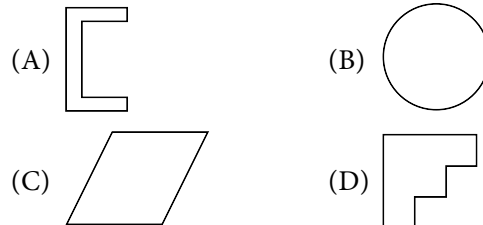


8. How many lines of symmetry does the given figure have?

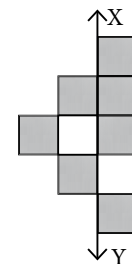


- (A) 0
- (B) 1
- (C) 2
- (D) 3

9. Which of the following shapes has more than one line of symmetry?



10. What is the least number of squares that must be added so that the line XY becomes the line of symmetry?



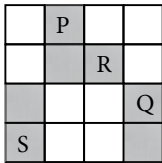
- (A) 4
- (B) 5
- (C) 3
- (D) 6

11. The number of lines of symmetry in the given figure is \_\_\_\_\_.



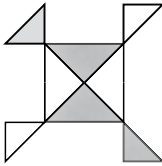
- (A) 1
- (B) 3
- (C) 0
- (D) 2

12. Which square must be unshaded so that the given figure has atleast one line of symmetry?



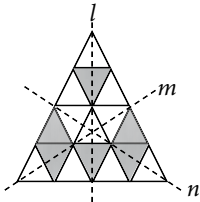
- (A) P (B) Q  
(C) R (D) S

13. How many lines of symmetry does the given figure have?



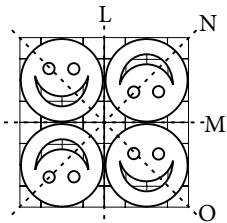
- (A) 1 (B) 2  
(C) 3 (D) None of these

14. Which of the following dotted lines is a line of symmetry for the given figure?

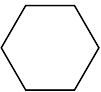


- (A)  $l$  (B)  $m$   
(C)  $n$  (D) None of these

15. Which of the following dotted lines is the line of symmetry for the given figure?



- (A) L (B) M  
(C) N (D) O

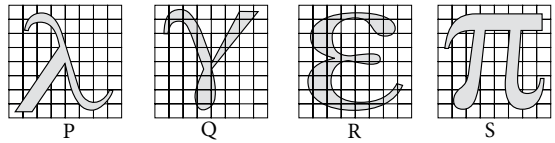
16.  has \_\_\_\_\_ lines of symmetry.

- (A) 4 (B) 5  
(C) 6 (D) 7

17. Which of the following letters has no line of symmetry?

- (A) I (B) O  
(C) K (D) D

18. Which figure has a line of symmetry?



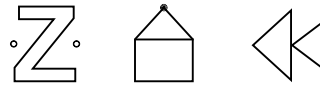
- (A) Only P (B) Both P and Q  
(C) Only R (D) None of these

19. There are \_\_\_\_\_ line(s) of symmetry in the given figure.

- (A) 1 (B) 4  
(C) 3 (D) 2



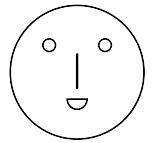
20. How many of the following figures has atleast one line of symmetry?



- (A) 0 (B) 1  
(C) 2 (D) 3

21. Find the number of lines of symmetry in the given figure.

- (A) 3 (B) 2  
(C) 4 (D) 1

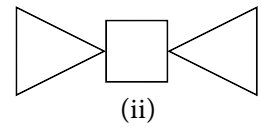
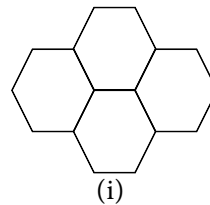


22. How many lines of symmetry does the given figure have?



- (A) 0 (B) 1  
(C) 2 (D) 3

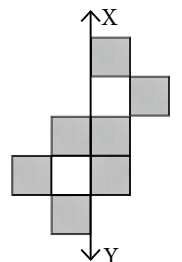
23. How many more lines of symmetry figure (i) has than figure (ii)?



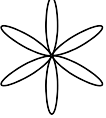
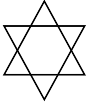
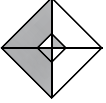
- (A) 2 (B) 1  
(C) 3 (D) 0

24. What is the least number of squares that must be added so that the line XY becomes a line of symmetry?

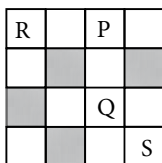
- (A) 1  
(B) 2  
(C) 4  
(D) 5



25. Which of the following figures has more than 1 line of symmetry?

- (A)  (B) 
- (C)  (D) Both (A) and (B)

26. Which square must be shaded so that the figure has a line of symmetry?



- (A) Q (B) P  
(C) R (D) S

27. A circle has \_\_\_\_\_ lines of symmetry than rectangle.

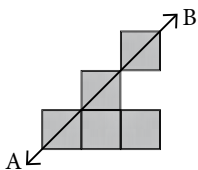
- (A) More (B) Less  
(C) Equal (D) Can't be determined

28. How many of the following letters have exactly two lines of symmetry?

H J L U X C





- (A) 2 (B) 4  
(C) 3 (D) 5

29. What is the least number of squares that must be added so that the line AB becomes a line of symmetry?

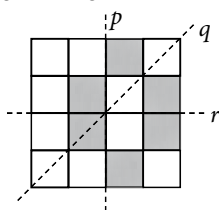


- (A) 1 (B) 2  
(C) 3 (D) 4

30. Which of the following figures has a line of symmetry?

- (A)  (B) 
- (C)  (D) 

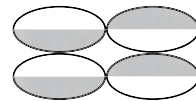
31. Which of the following dotted lines is a line of symmetry for the given figure?



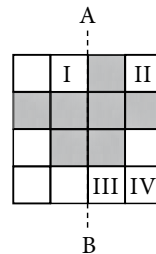
- (A) q (B) p  
(C) r (D) None of these

32. How many lines of symmetry does the given figure have?

- (A) 1 (B) 2 (C) 3 (D) 0

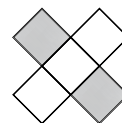


33. Which of the squares must be shaded so that the dotted line AB becomes the line of symmetry?



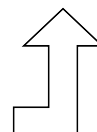
- (A) I (B) II  
(C) III (D) IV

34. There are \_\_\_\_\_ lines of symmetry in the given figure.



- (A) 2 (B) 3  
(C) 4 (D) 5

35. How many lines of symmetry are there in the given figure?

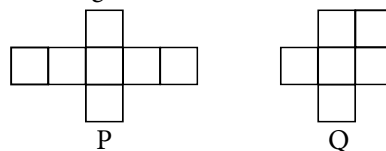


- (A) 1 (B) 2  
(C) 0 (D) 3

36. Which of the following has maximum number of line(s) of symmetry?

- (A)  (B) 
- (C)  (D) 

37. There is/are \_\_\_\_\_ less line(s) of symmetry in figure Q than in figure P.



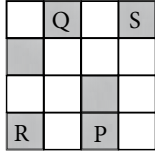
- (A) 1 (B) 2  
(C) 3 (D) 4

38. There are \_\_\_\_\_ letters which have exactly one line of symmetry.

A M C O V

- (A) 2 (B) 3  
(C) 5 (D) 4

39. Which of the following squares must be unshaded so that the given figure has a line of symmetry?



- (A) Q (B) S  
(C) P (D) R

40. Which of the following figure is not symmetrical?

- (A) (B)   
(C) (D) None of these

41. How many of following numbers have atleast two lines of symmetry?

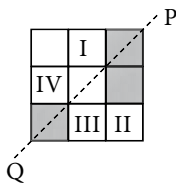
2 4 6 8 1 5

- (A) 0 (B) 1  
(C) 2 (D) 3

42. Which of the following shapes do not have any line of symmetry?

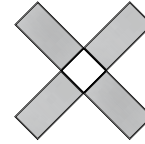
- (A) (B)   
(C) (D) None of these

43. Which square must be shaded so that the given figure has PQ as a line of symmetry?



- (A) I (B) II  
(C) III (D) IV

44. There are \_\_\_\_\_ lines of symmetry in the given figure.



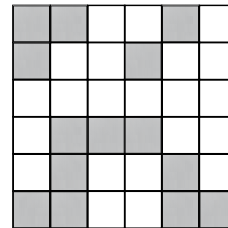
- (A) 1 (B) 3  
(C) 2 (D) 4

45. Which of the following figures has no line of symmetry?

- (A) (B)   
(C) (D)

## Achievers Section (HOTS)

46. What is the smallest number of squares that must be shaded so that the given figure has a line of symmetry?



- (A) 5 (B) 4  
(C) 6 (D) 8

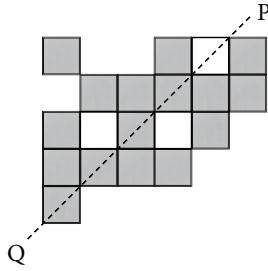
47. Match the figures in Column-I with their number of lines of symmetry in Column-II.

- | Column-I  | Column-II |
|---|-----------|
| (a)  (one upright, one inverted)                    | (p) 2     |
| (b)  (two on the left, two on the right)            | (q) 1     |
| (c)  (one in the top-left, one in the bottom-right) | (r) 3     |

- (A) (a) → (p); (b) → (q); (c) → (r)  
(B) (a) → (q); (b) → (r); (c) → (p)  
(C) (a) → (q); (b) → (q); (c) → (p)  
(D) (a) → (r); (b) → (p); (c) → (q)

## SOF IMO 2019 QUESTIONS

48. What is the smallest number of squares that must be added so that the line PQ becomes a line of symmetry?



- (A) 5                      (B) 6  
(C) 8                      (D) 9

49. State 'T' for true and 'F' for false and select the correct option.

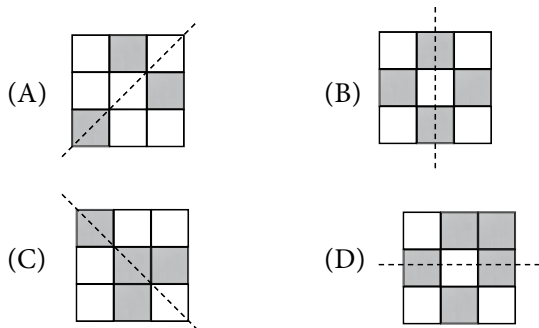
(i) There is no line of symmetry in

(ii) has exactly one line of symmetry.

(iii) The number of lines of symmetry in is 2.

- |     | (i) | (ii) | (iii) |
|-----|-----|------|-------|
| (A) | T   | T    | F     |
| (B) | F   | T    | F     |
| (C) | T   | F    | F     |
| (D) | F   | F    | T     |

50. Which of the following figures is not symmetric along the dotted line?

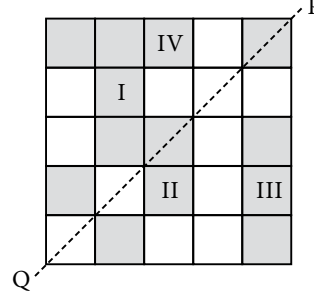


1. How many of the following letters do not have any line of symmetry?

# TRICK

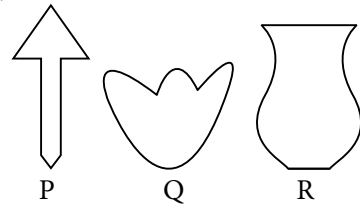
- (A) None                      (B) Two  
(C) Three                      (D) Four                      (Level-1)

2. Which of the following squares must be unshaded so that PQ becomes the line of symmetry?



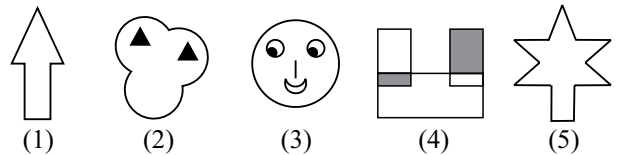
- (A) I                              (B) IV  
(C) III                              (D) II                              (Level-1)

3. Which of the following figures have at least one line of symmetry?



- (A) Only P and Q                      (B) Only Q and R  
(C) Only P and R                      (D) All of these                      (Level-1)

4. Which of the following figures are symmetric?

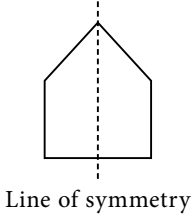


- (A) Only (1) and (5)                      (B) Only (2) and (5)  
(C) Only (1), (2), (3) and (4)  
(D) Only (1), (3) and (5)                      (Level-2)

# HINTS & EXPLANATIONS

## SELF TEST - 1

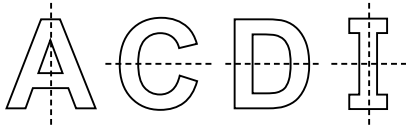
1. (B):



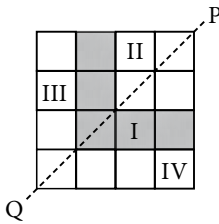
2. (D)

3. (A)

4. (D):

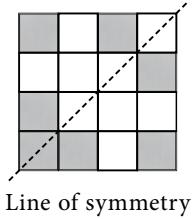


5. (A):



## EXERCISE

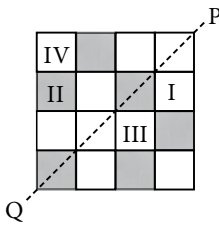
1. (A):



2. (A):

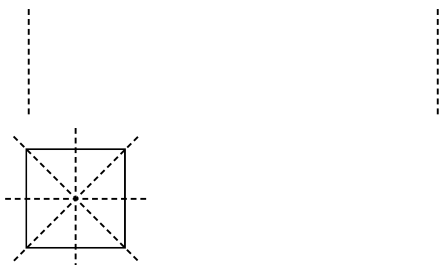


3. (B):



4. (A)

5. (D):



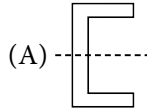
A square has 4 lines of symmetry.

7. (D):

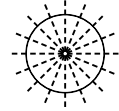


8. (A)

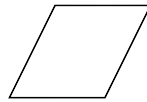
9. (B):



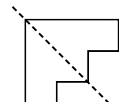
(B)



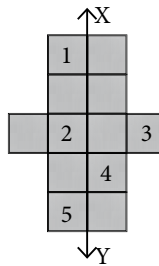
(C)



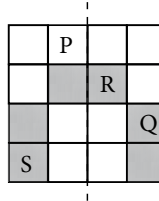
(D)



10. (B):



11. (C)



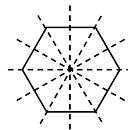
12. (A):

13. (D)

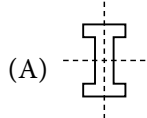
14. (A)

15. (B)

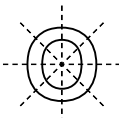
16. (C):



17. (C):



(B)



(C)

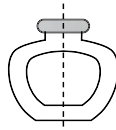


(D)

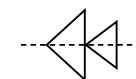
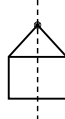


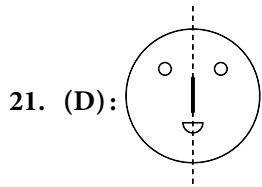
18. (D)

19. (A):

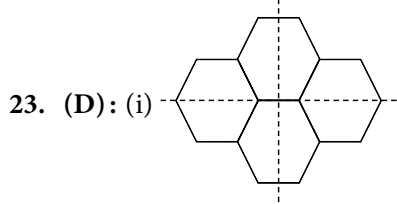


20. (C):

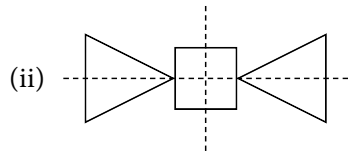




22. (B)

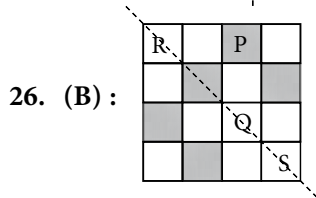
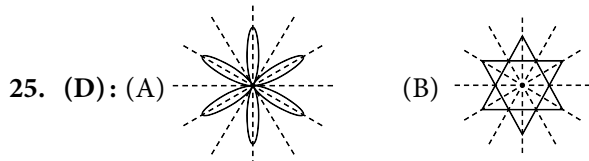
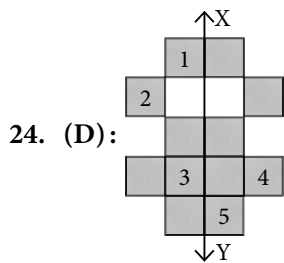


Number of lines of symmetry = 2

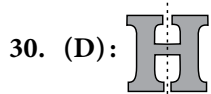
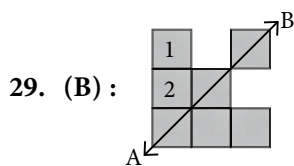
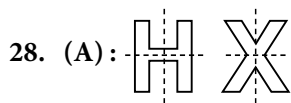


Number of lines of symmetry = 2

So, both figure (i) and (ii) have same number of lines of symmetry.

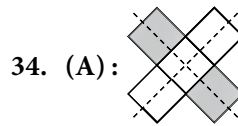
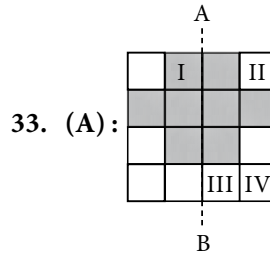


27. (A)



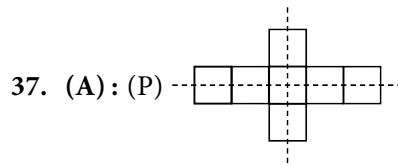
31. (C)

32. (D)

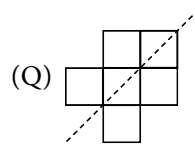


35. (C)

36. (D)

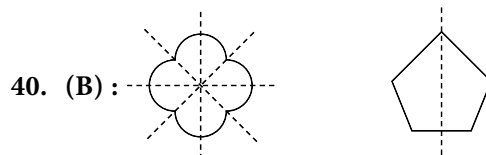
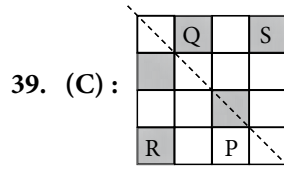


There are 2 lines of symmetry in figure (P).

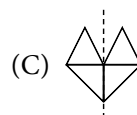
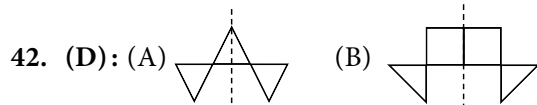


There is 1 line of symmetry in figure (Q).

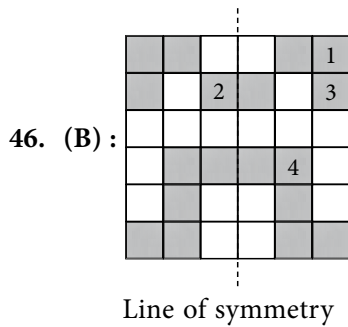
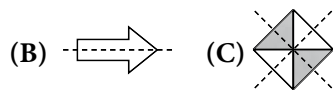
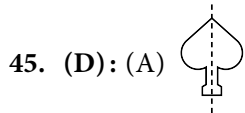
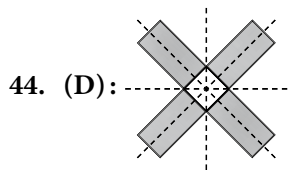
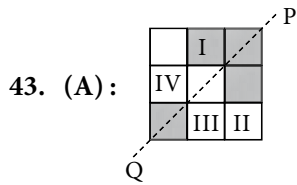
So, there is  $(2 - 1) = 1$  less line of symmetry in figure Q than in figure P.



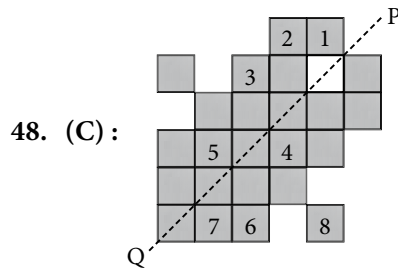
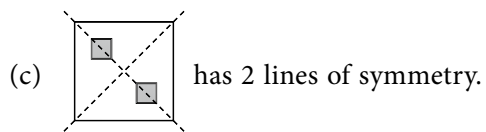
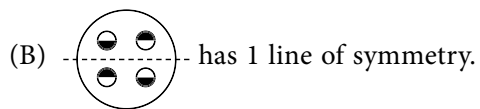
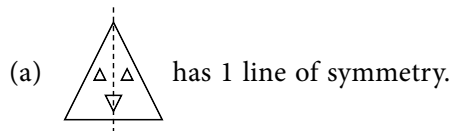
41. (A)



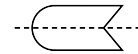




47. (B):



49. (B): (i) False;



There is one line of symmetry.

(ii) True;



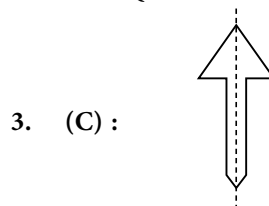
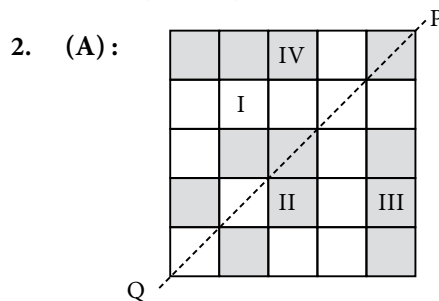
The figure has exactly one line of symmetry.

(iii) False; There is no line of symmetry in the given figure.

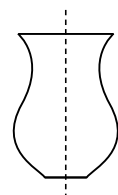
50. (D)

### SOF IMO 2019 QUESTIONS

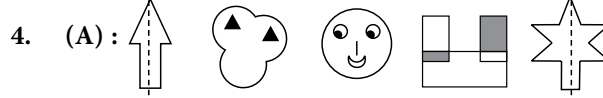
1. (B): **TRICK**



Line of symmetry



Line of symmetry



So, only figure (1) and (5) are symmetric.