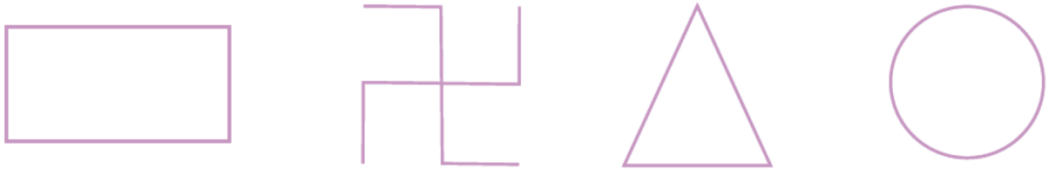
NCERT Exemplar Class 6 Mathematics
Chapter 9: Symmetry and Practical Geometry
Complete Solutions

Section A: Multiple Choice Questions
Choose the correct answer from the given options (1-17)
Question 1
In the following figures, the figure that is not symmetric with respect to any line is:



(i) (ii) (iii) (iv)

- (A) (i)
- (B) (ii)
- (C) (iii)
- (D) (iv)

Solution: (B) L-shaped figure
Explanation: A figure is said to have line symmetry if, by folding the figure along a line, the left and right parts coincide exactly. The line is called the line (or axis) of symmetry of the figure. The L-shaped figure does not have any line of symmetry.
Question 2
The number of lines of symmetry in a scalene triangle is:

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

Solution: (A) 0
Explanation: A scalene triangle is a triangle that has three unequal sides. Therefore, there are no lines of symmetry in a scalene triangle.
Question 3
The number of lines of symmetry in a circle is:

- (A) 0
- (B) 2
- (C) 4
- (D) more than 4

Solution: (D) more than 4
Explanation: A circle has infinite lines of symmetry. Any diameter of the circle acts as a line of symmetry.
Question 4
Which of the following letters does not have a vertical line of symmetry?

- (A) M
- (B) H
- (C) E
- (D) V

Solution: (C) E

Explanation: When we draw a vertical line through the middle of each letter:

- M: Has vertical symmetry
- H: Has vertical symmetry
- E: Does not have vertical symmetry
- V: Has vertical symmetry

Question 5

Which of the following letters has both horizontal and vertical lines of symmetry?

- (A) X
- (B) E
- (C) M
- (D) K

Solution: (A) X

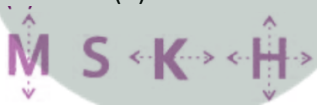
Explanation: The letter X has both horizontal and vertical lines of symmetry passing through its center.

Question 6

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

- (A) M
- (B) S
- (C) K
- (D) H

Solution: (B) S



Explanation: The letter S does not have any line of symmetry, neither horizontal nor vertical.

Question 7

Which of the following letters has only one line of symmetry?

- (A) H
- (B) X
- (C) Z
- (D) T

Solution: (D) T

Explanation: The letter T has only one line of symmetry - a vertical line passing through its center.

Question 8

The instrument used to measure an angle is:

- (A) Ruler
- (B) Protractor
- (C) Divider
- (D) Compasses

Solution: (B) Protractor
Explanation: A protractor is an instrument for measuring angles, typically in the form of a flat semicircle marked with degrees along the curved edge.

Question 9

The instrument used to draw a circle is:

- (A) Ruler
- (B) Protractor
- (C) Divider
- (D) Compasses

Solution: (D) Compasses
Explanation: Compasses (also called a compass) is the instrument used to draw circles and arcs.

Question 10

Number of set squares in a geometry box is:

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

Solution: (C) 2
Explanation: A standard geometry box contains two set squares - one with angles 45°-45°-90° and another with angles 30°-60°-90°.

Question 11

The number of lines of symmetry in a ruler is:

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

Solution: (C) 2
Explanation: A ruler has the shape of a rectangle. A rectangle has 2 lines of symmetry - one horizontal and one vertical line passing through the center.

Question 12

The number of lines of symmetry in a divider is:

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

Solution: (B) 1
Explanation: A divider has only one line of symmetry passing through its center vertically.

Question 13

The number of lines of symmetry in compasses is:

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

Solution: (A) 0

Explanation: Compasses do not have any line of symmetry due to their asymmetric design.

Question 14

The number of lines of symmetry in a protractor is:

- (A) 0
- (B) 1
- (C) 2
- (D) more than 2

Solution: (B) 1

Explanation: A protractor (semicircular) has only one line of symmetry - the vertical line passing through its center.

Question 15

The number of lines of symmetry in a 45°-45°-90° set-square is:

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

Solution: (B) 1

Explanation: A 45°-45°-90° set-square is an isosceles right triangle, which has one line of symmetry.

Question 16

The number of lines of symmetry in a 30°-60°-90° set square is:

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

Solution: (A) 0

Explanation: A 30°-60°-90° set-square is a scalene triangle, which has no lines of symmetry.

Question 17

The instrument in the geometry box having the shape of a triangle is called:

- (A) Protractor
- (B) Compasses
- (C) Divider
- (D) Set-square

Solution: (D) Set-square

Explanation: Set-squares are triangular instruments used in geometry for drawing angles and parallel lines.

Section B: Fill in the Blanks

Complete the following statements (18-30)

Question 18

The distance of the image of a point (or an object) from the line of symmetry (mirror) is _____ as that of the point (object) from the line (mirror).

Solution: same

Explanation: In reflection, the distance of the object from the mirror equals the distance of the image from the mirror.

Question 19

The number of lines of symmetry in a picture of Taj Mahal is _____.

Solution: one

Explanation: The Taj Mahal has one vertical line of symmetry passing through its center.

Question 20

The number of lines of symmetry in a rectangle and a rhombus are _____ (equal/unequal).

Solution: equal

Explanation: Both rectangle and rhombus have 2 lines of symmetry each.

Question 21

The number of lines of symmetry in a rectangle and a square are _____ (equal/unequal).

Solution: unequal

Explanation: A rectangle has 2 lines of symmetry while a square has 4 lines of symmetry.

Question 22

If a line segment of length 5cm is reflected in a line of symmetry (mirror), then its reflection (image) is a _____ of length _____.

Solution: line segment, 5cm

Explanation: The reflection of a line segment is another line segment of the same length.

Question 23

If an angle of measure 80° is reflected in a line of symmetry, then the reflection is an _____ of measure _____.

Solution: angle, 80°

Explanation: The reflection of an angle preserves its measure.

Question 24

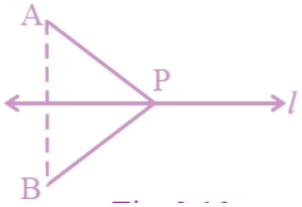
The image of a point lying on a line l with respect to the line of symmetry l lies on _____.

Solution: line l

Explanation: If a point lies on the line of symmetry, its image also lies on the same line.

Question 25

In the given figure, if B is the image of point A with respect to line l and P is any point lying on l, then the lengths of line segments PA and PB are _____.



Solution: equal

Explanation: For any point P on the line of symmetry, the distances PA and PB are equal.

Question 26

The number of lines of symmetry in the given flower design is _____.

Solution: 5

Explanation: The five-petaled flower design has 5 lines of symmetry.

Question 27

The common properties in the two set-squares of a geometry box are that they have a _____ angle and they are of the shape of a _____.

Solution: right, triangle

Explanation: Both set-squares have a 90° (right) angle and are triangular in shape.

Question 28

The digits having only two lines of symmetry are _____ and _____.

Solution: 0, 8

Explanation: The digits 0 and 8 each have two lines of symmetry (one horizontal and one vertical).

Question 29

The digit having only one line of symmetry is _____.

Solution: 3

Explanation: The digit 3 has only one horizontal line of symmetry.

Question 30

The number of digits having no line of symmetry is _____.

Solution: 7

Explanation: The digits 1, 2, 4, 5, 6, 7, and 9 have no lines of symmetry. That makes 7 digits in total.

Key Concepts Summary

Lines of Symmetry

- **Definition:** A line of symmetry divides a figure into two identical halves that coincide when folded along the line.
- **Circle:** Has infinite lines of symmetry
- **Rectangle:** Has 2 lines of symmetry
- **Square:** Has 4 lines of symmetry
- **Rhombus:** Has 2 lines of symmetry
- **Scalene Triangle:** Has 0 lines of symmetry
- **Isosceles Triangle:** Has 1 line of symmetry
- **Equilateral Triangle:** Has 3 lines of symmetry

Geometry Instruments

- **Protractor:** Measures angles
- **Compasses:** Draws circles and arcs
- **Divider:** Measures and transfers distances
- **Set-squares:** Draw specific angles (30°-60°-90° and 45°-45°-90°)
- **Ruler:** Measures length and draws straight lines

Properties of Reflection

- Distance from object to mirror = Distance from image to mirror
- The reflection preserves size and shape
- Angles and lengths remain unchanged in reflection
- A point on the line of symmetry is its own image