



Chapter 14

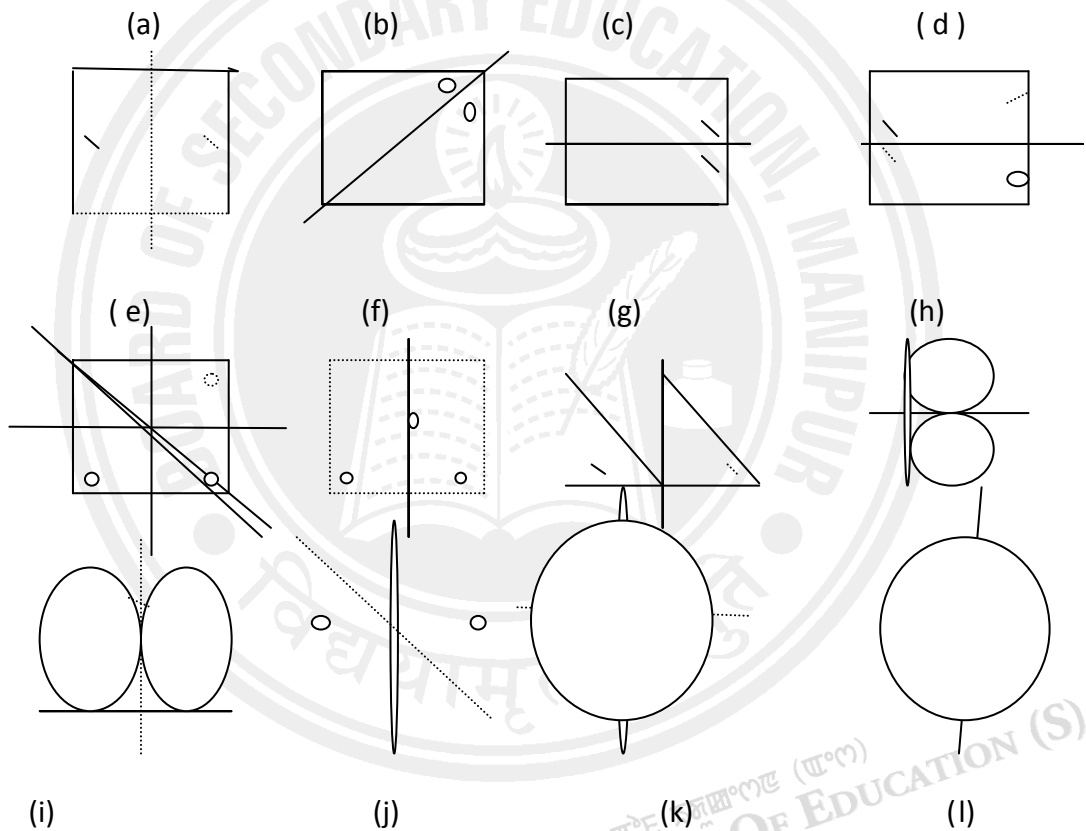
Symmetry

SOLUTIONS:

Exercise 14.1

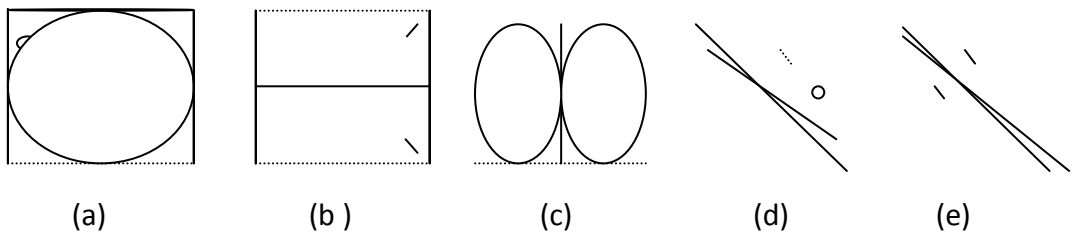
Q1. Copy the figures with punched holes and find the axes of symmetry for the following :

Ans :



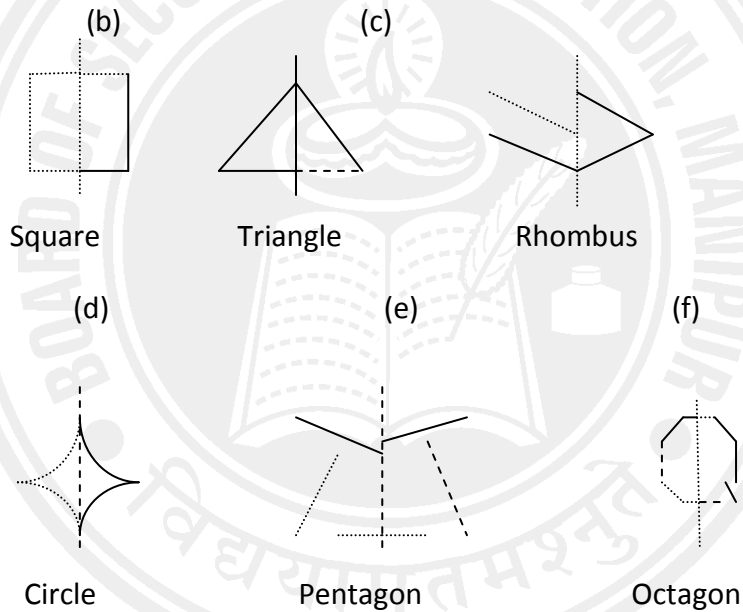
Q2. Given the line of symmetry find the other hole :

Ans :



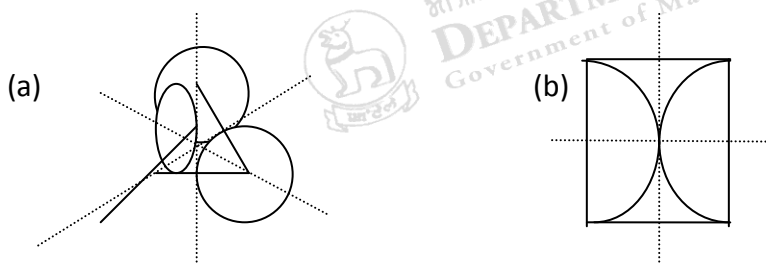
Q3. Complete each figure performing reflection in the dotted mirror line . are you able to recall the name of the figure you complete .

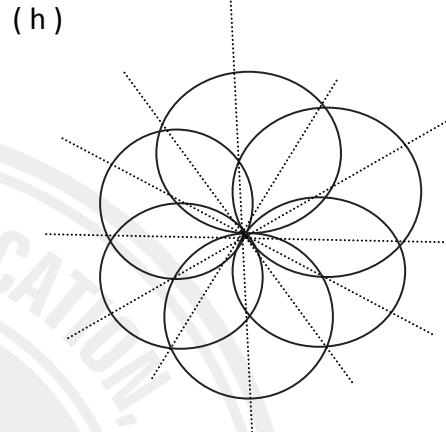
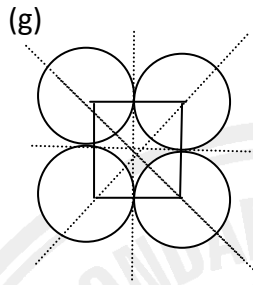
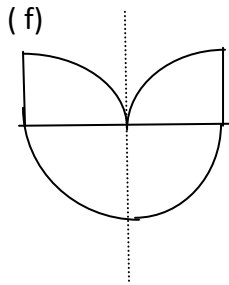
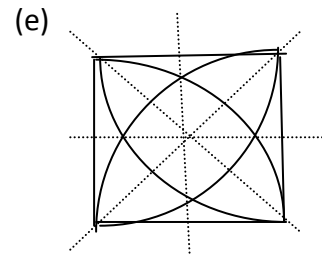
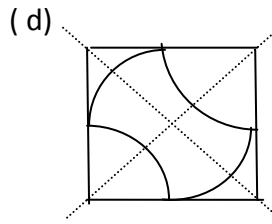
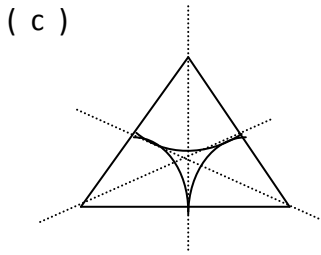
Ans: (a)



Q4. Identify multiple lines of symmetry if any in each of the following figures:

Ans :

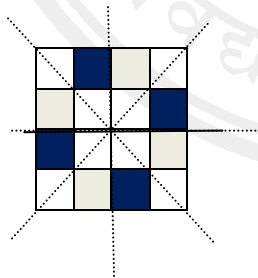




Q5. Copy the figure given here .

Take any one diagonal as a line of symmetry and shade a few more squares to make the figure symmetric about a diagonal . Is there more than one way to do that? Will the figure be symmetric about both the diagonals?

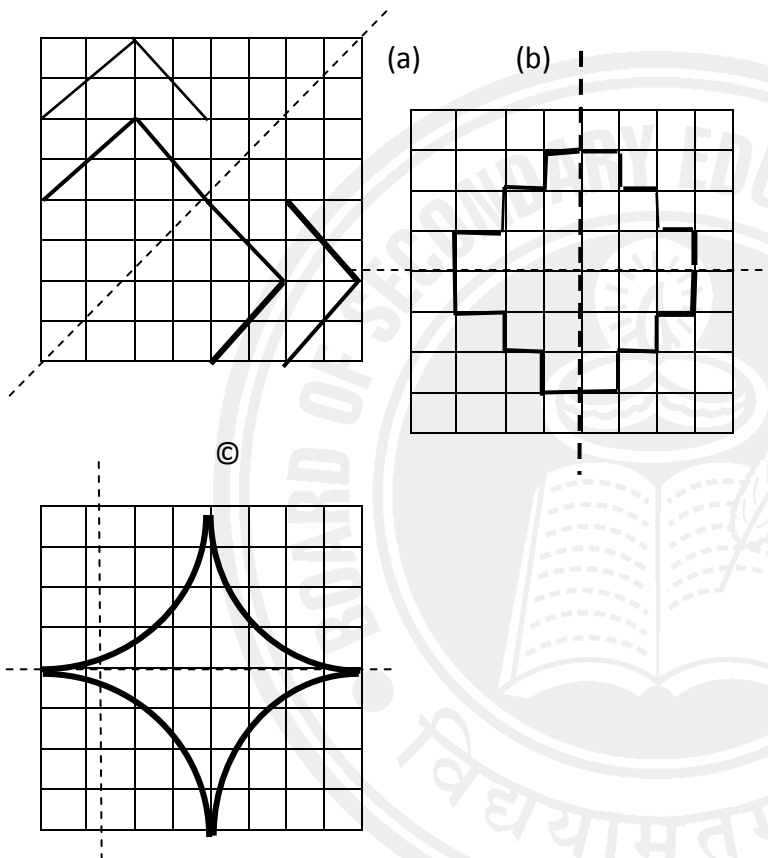
Ans :



The figure is symmetric about both the diagonals.

Q6. Copy the diagram and complete each shape to be symmetric about the mirror line .

Ans:



Q7. State the number of lines of symmetry for the following figures :

- (a) An Equilateral Triangle . Ans : 3
- (b) An Isosceles triangle. Ans : 1
- (c) A scalene triangle. Ans : 0
- (d) A square. Ans : 4
- (e) A rectangle. Ans : 2
- (f) A rhombus. Ans : 2
- (g) A parallelogram. Ans : 0
- (h) A quadrilateral. Ans : 0
- (i) A regular hexagon. Ans : 6
- (j) A circle. Ans : infinite.

Q8. What letters of the English alphabet have reflectional symmetry about.

(a) a vertical mirror. Ans : A, H, I, M, O, T, U, V, W, X, Y

(b) a horizontal mirror. Ans : B, C, D, E, H, I, K, O, X

(c) Both horizontal and vertical mirrors. Ans: H, I, O, X

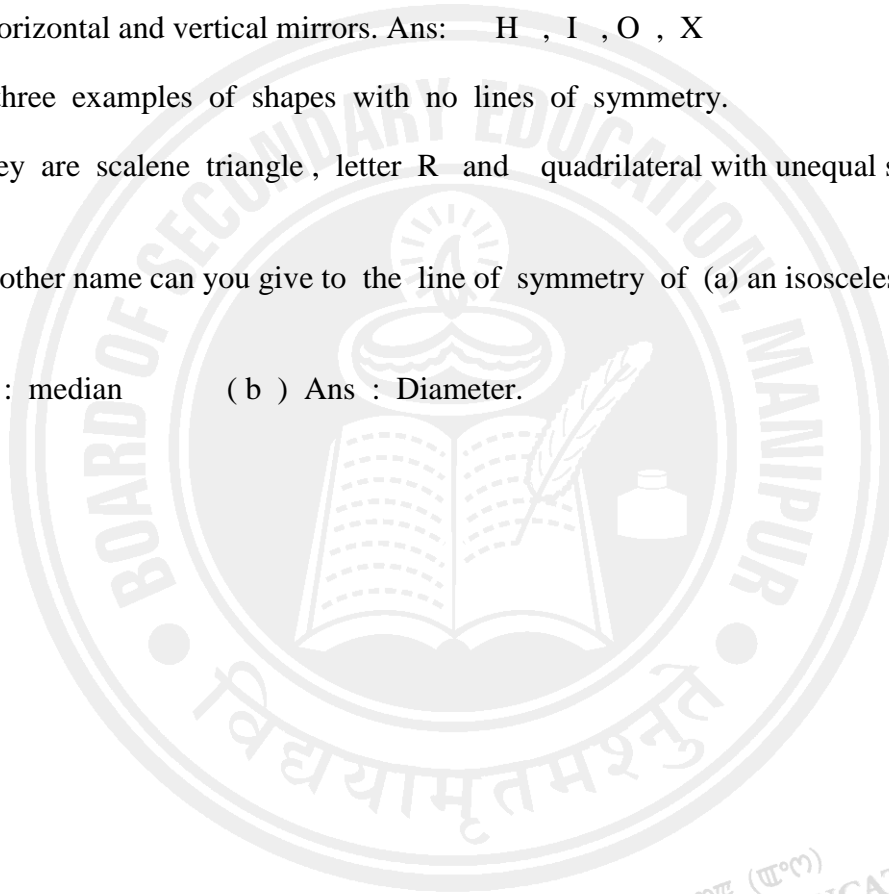
Q9. Give three examples of shapes with no lines of symmetry.

Ans : They are scalene triangle, letter R and quadrilateral with unequal sides in length.

Q10. What other name can you give to the line of symmetry of (a) an isosceles triangle, (b) a circle.

(a) Ans : median

(b) Ans : Diameter.



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Exercise 14.2

Q1. Which of the following figures have rotational symmetry of order more than 1:

Ans : (a) , (b) , (d) , (e) and (f)

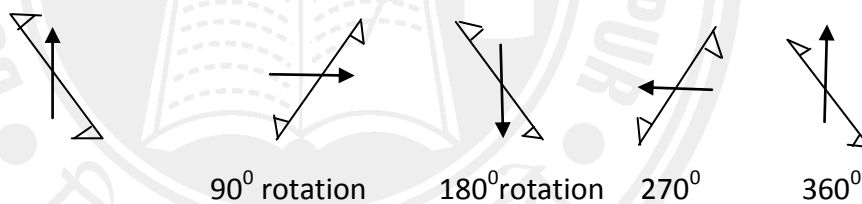
Q2. Give the order of rotational symmetry for each figure :

(a) Ans : 2 (b) Ans : 2 (c) Ans : 3 (d) Ans : 4 (e) Ans : 4

(f) Ans : 5 (g) Ans : 6 (h) Ans : 3

**** How we find the order

(a)



We will rotate these angular positions and count how many times it show symmetry.

Here it is two times so the order is 2 .



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Exercise 14.3

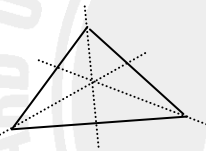
Q1. Name two figures that have both line symmetry and rotational symmetry.

Ans : square , triangle.

Q2. Draw

(i) a triangle with both line and rotational symmetry of order more than 1.

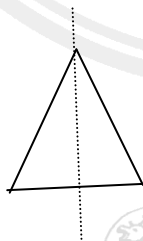
Ans :



An equilateral triangle has both line and rotational symmetry more than 1.

(ii) a triangle with only line symmetry and no rotational symmetry of order more than 1.

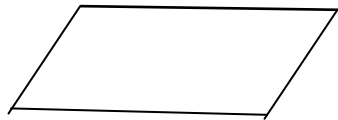
Ans :



An isosceles triangle has 1 line symmetry and rotational symmetry of order 1.

(iii) A quadrilateral with rotational symmetry of order more than 1 but not a line symmetry.

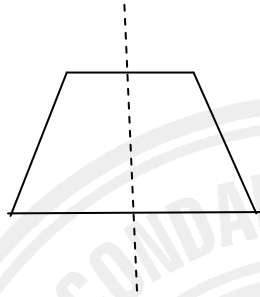
Ans :



No line symmetry but rotational symmetry of order 2

(iv) a quadrilateral with line symmetry but not a rotational symmetry of order more than 1.

Ans :



A quadrilateral with line symmetry but no rotational symmetry more than 1.

Q3 If a figure has two or more lines of symmetry, should it have rotational symmetry of order more than 1?

Ans : yes

Q4. Fill up the blanks :

Ans :

Shape	Centre of rotation	Order of rotation	Angle of rotation
Square	Intersecting point of diagonals	4	90°
Rectangle	Intersecting point of diagonals	2	180°
Rhombus	Intersecting point of diagonals	2	180°
Equilateral triangle	Intersecting point of medians	3	120°
Regular hexagon	Intersecting point of diagonals	6	60°
Circle	centre	infinite	Any angle
Semi circle	centre	4	90°

Q5. Name the quadrilateral which both line and rotational symmetry of order more than 1.

Ans : square

Q6. After rotating by 60° about a centre a figure looks exactly the same as its original position. At what other angles will this happen for the figure?

Ans : 120° , 180° , 240° , 300° , 360°

Q7. Can we have a rotational symmetry of order more than 1 whose angle of rotation is (i) 45° (ii) 17°

Ans : 45° may be rotational angle but 17° cannot be .

