



MATHS

BOOKS - MTG IIT JEE FOUNDATION

SYMMETRY

Illustration

1. Draw 2 lines of symmetry of the given figure.



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2. For the figure given below, draw the lines of symmetry (if possible).



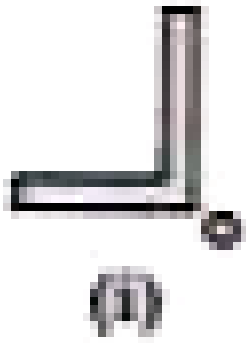
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3. How many lines of symmetry can be drawn through letter E?



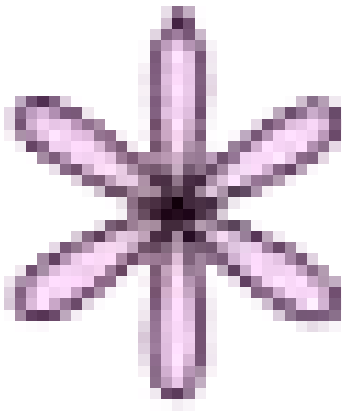
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4. Draw the figure, which will be obtained if we rotate these shapes through an angle of 120 degree clockwise?



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5. What is the order of rotational symmetry of following figure?



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6. State the order of rotational symmetry of these shapes.

(i)



(ii)



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7. Name any two figures that have both line symmetry and rotational symmetry.



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8. What is the number of lines of symmetry and order of rotational symmetry of a regular

hexagon?



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9. Draw a rough sketch of a quadrilateral with a rotational symmetry of order more than 1 but no line of symmetry.



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Solved Examples

1. How many lines of symmetry are there in the following?

(i) Circle (ii) Rectangle



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2. Draw a line segment of 3 cm and draw its line of symmetry.



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3. Define centre of rotation.



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4. Define order of rotational symmetry.



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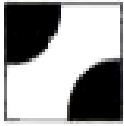
5. What is the order of rotational symmetry of a regular octagon?



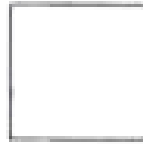
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6. Which of the following figures have more than one lines of symmetry?

(i)



(ii)



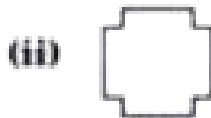
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7. Draw and find the number of lines symmetry of a regular pentagon.



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8. Find the lines of symmetry in the following



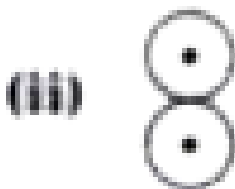
figures.



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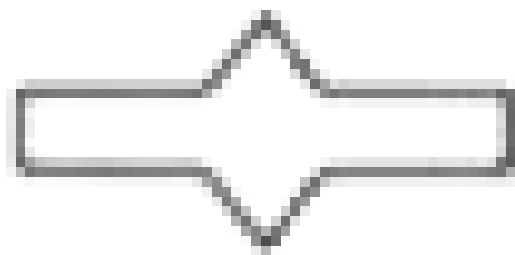
9. Draw the lines of symmetry in the following

figures.



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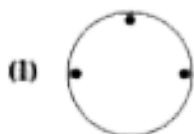
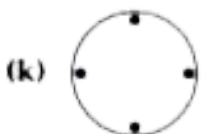
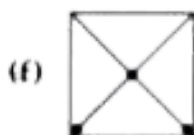
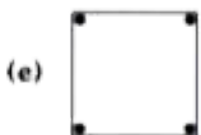
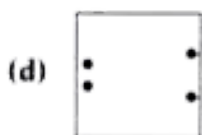
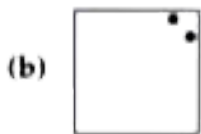
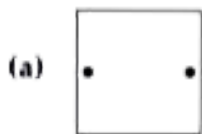
10. What is the order of rotational symmetry of the given figure.



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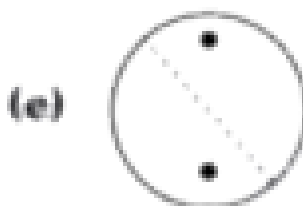
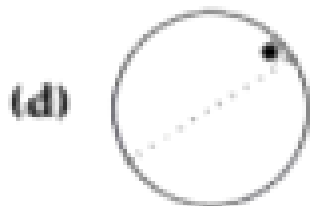
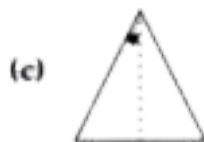
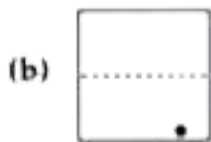
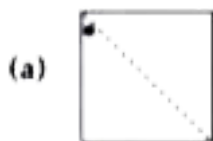
Ncert Section Exercise 13.1

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



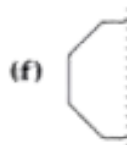
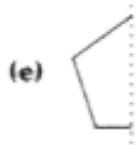
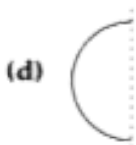
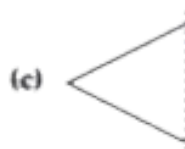
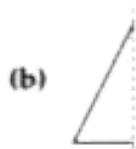
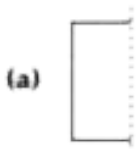
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2. Given the line(s) of symmetry, find the other hole(s).



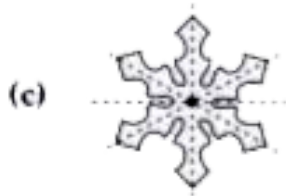
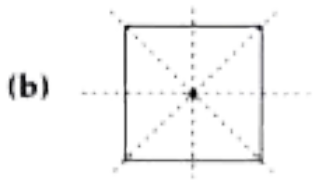
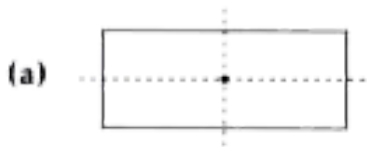
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3. In the following figures, the mirror line (i.e, the line of symmetry) is given as a dotted line. Complete each figure performing reflection in the dotted (mirror) line. (You might perhaps place a mirror along the dotted line and look into the mirror for the image). Are you able to recall the name of the figure you complete?



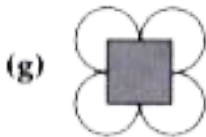
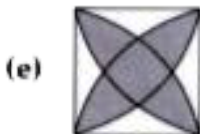
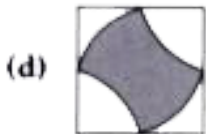
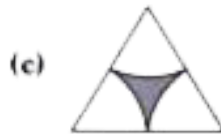
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4. The following figures have more than one line of symmetry. Such figures are said to have multiple line of symmetry.



Identify multiple lines of symmetry, if any, in

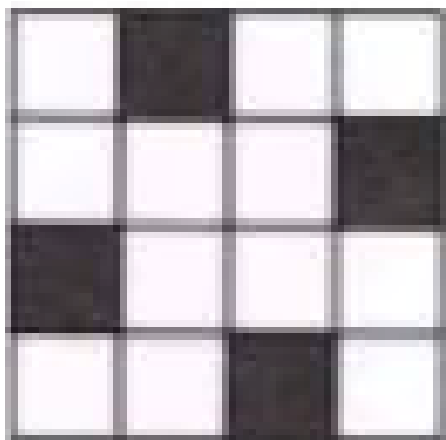
each of the following figures:



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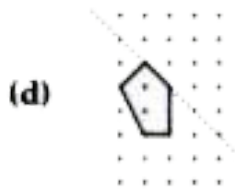
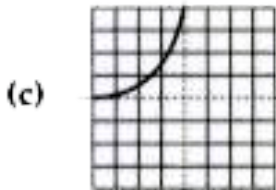
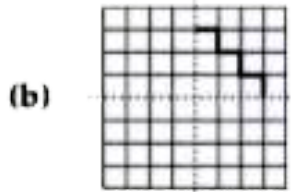
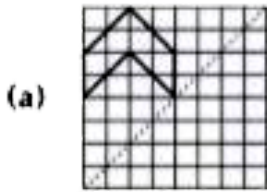
5. Copy the figure given here. Take any one diagonal as a line of symmetry and shade a few more squares to make the figure symmetric about a diagonal. Is symmetric

about a diagonal. Is there more than one way to do that? Will the figure be symmetric about both the diagonals?



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6. Copy the diagram and complete each shape to be symmetric about the mirror line(s).



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7. State the number of lines of symmetry for the following figures.

(a) An equilateral triangle

(b) An isosceles triangle

(c) A scalene triangle

(d) A square

(e) A rectangle (f) A rhombus

(g) A parallelogram (h) A quadrilateral

(i) A regular hexagon (j) A circle



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8. Fill in the blanks: English alphabet Letter,
Line Symmetry, Number of Lines of symmetry,

Rotational Symmetry, Order of rotational

Symmetry Z S H O E N C, Nil - Yes Yes Yes --, 0 --

----, Yes - Yes Yes - Yes -, 2 -----



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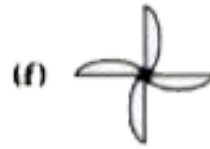
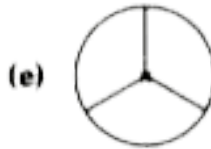
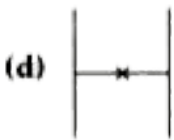
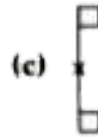
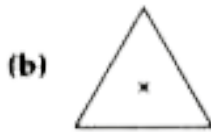
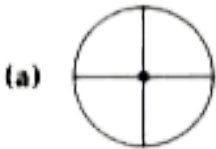
9. What other name can you give to the line of symmetry of (a) an isosceles triangle? (b) a circle?



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Ncert Section Exercise 13 2

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



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Ncert Section Exercise 13 3

1. Name any two figures that have both line symmetry and rotational symmetry.



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2. Draw, wherever possible, a rough sketch of
(i) a triangle with both line and rotational symmetries of order more than 1. (ii) a triangle with only line symmetry and no rotational symmetry of order more than 1. (iii) a quadrilateral with a rotational



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



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4. Fill in the blanks

Shape	Centre of Rotation	Order of Rotation	Angle of Rotation
Square			
Rectangle			
Rhombus			
Equilateral triangle			
Regular hexagon			
Circle			
Semi-circle			



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5. Name the quadrilaterals which have both line and rotational symmetry of order more

than 1.



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6. 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?



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7. Can we have a rotational symmetry of order more than 1 whose angle of rotation is

(i) 45° (ii) 17° ?



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Exercise Multiple Choice Questions

1. If a regular polygon has n sides, then its number of symmetrical lines is

A. 2

B. 4

C. n

D. $n+2$

Answer: C



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2. Which of the following figure has infinitely many number of lines of symmetry?

A. A circle

B. A regular octagon

C. A scalene triangle

D. An English alphabet S

Answer: A



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3. A square has a rotational symmetry of order

A. 1

B. 2

C. 3

D. 4

Answer: D



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4. Which of the following letters has the reflectional symmetry about both the horizontal and vertical mirror?

A. A

B. B

C. H

D. T

Answer: C



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5. A figure has a rotational symmetry of order more than 1, the angle of rotation can be

A. 21°

B. 22°

C. 23°

D. 24°

Answer: D



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6. Which of the following has no line of symmetry?

A. An angle

B. An isosceles triangle

C. A parallelogram

D. A semicircle

Answer: C



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7. The figure which has two lines of symmetry and rotational symmetry of order 2 is

A. a rhombus

B. an equilateral triangle

C. a semicircle

D. an isosceles trapezium

Answer: A



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8. The order of rotational symmetry of a circle is

A. 0

B. 1

C. 2

D. infinite

Answer: D



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9. The least angle of rotation of a regular pentagon

A. 72°

B. 90°

C. 180°

D. 360°

Answer: A



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10. The order of rotational symmetry of regular octagon is

A. 7

B. 8

C. 10

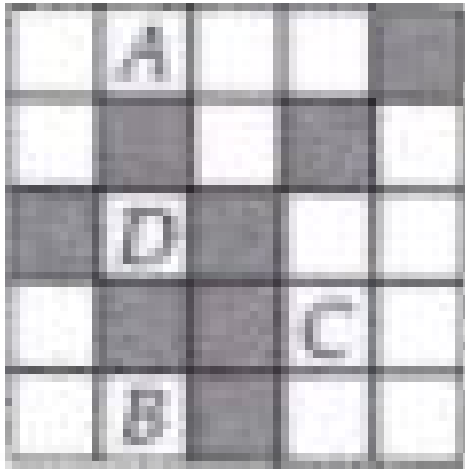
D. 6

Answer: B



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11. Which squares should be shaded to make the given figure symmetric?



A. A and B

B. A and D

C. B and C

D. C and D

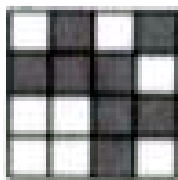
Answer: D



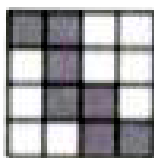
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12. Which of the following does not have a line of symmetry?

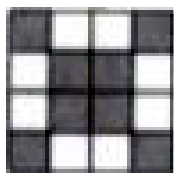
A.



B.



C.



D.



Answer: B



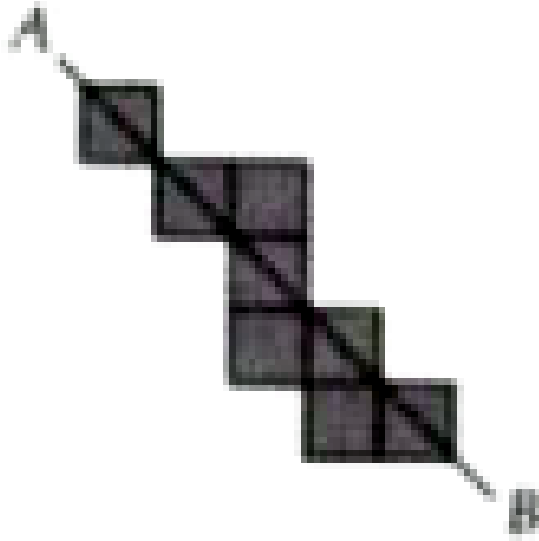
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13. What is the least number of squares that must be added so that the line AB becomes a

line

of

symmetry?



A. 3

B. 4

C. 2

D. 5

Answer: A



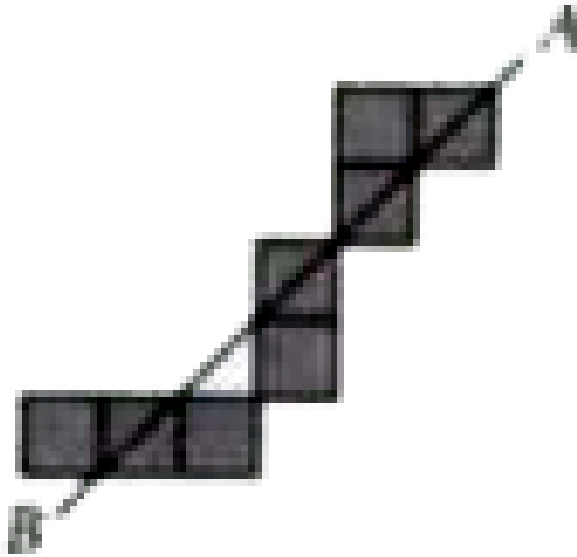
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14. What is the least number of squares that must be added so that the line AB becomes a

line

of

symmetry?



A. 3

B. 4

C. 5

D. 6

Answer: B



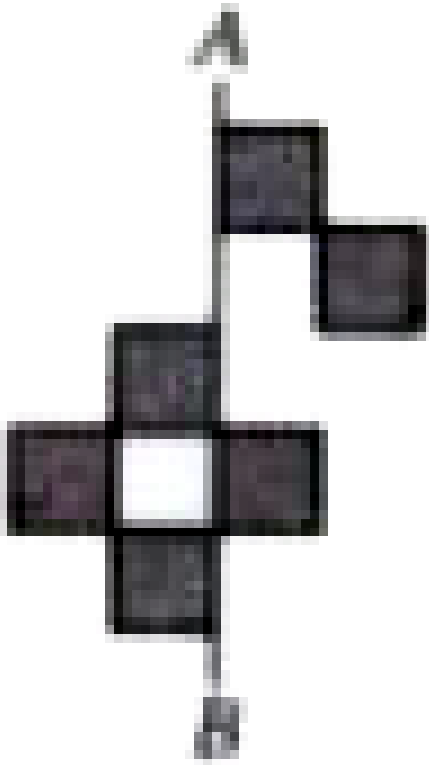
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15. What is the least number of squares that must be added so that the line AB becomes a

line

of

symmetry?



A. 4

B. 5

C. 6

D. 7

Answer: C



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16. Which of the following have both line symmetry and rotational symmetry of order more than 1?

A. A

B. H

C. C

D. Z

Answer: B



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17. Which of the following is incorrect?

A. Number 0 has both rotational and line of symmetry

B. Shape kite has only one line of symmetry.

C. A square has four lines of symmetry and rotational symmetry of order 2.

D. A rectangle has finite number of lines of symmetry.

Answer: C



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18. Angle of rotation of an equilateral triangle is

A. 90°

B. 120°

C. 60°

D. 30°

Answer: B



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19. Order of rotation of a regular pentagon is

A. 1

B. 5

C. 4

D. 0

Answer: B



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20. Which of the following letters does not have reflection symmetry about a vertical mirror?

A. A

B. Y

C. U

D. R

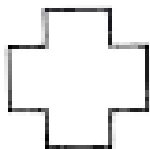
Answer: D



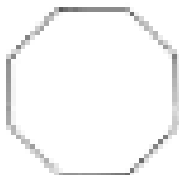
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21. Which of the following figures has 45° as angle of rotation?

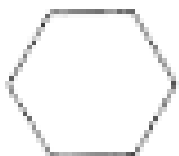
A.



B.



C.



D.

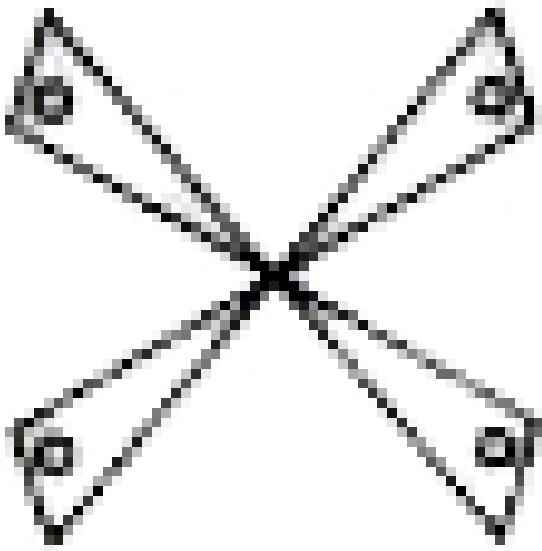


Answer: B



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22. The order of rotation of given figure is



A. 2

B. 4

C. 6

D. 1

Answer: A



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23. Which of the following letters has rotational symmetry of order more than 1 but not any line of symmetry?

A. X

B. S

C. B

D. T

Answer: C



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24. A figure has angle of rotation of 30° . Its order of rotation is

A. 3

B. 6

C. 12

D. None of these

Answer: B



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25. A figure has a rotational symmetry of order more than 1, the angle of rotation can be

A. 25°

B. 33°

C. 42°

D. 40°


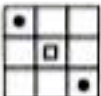


Answer: D



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Exercise Match The Following

1. Match the following

- | List-I | List-II |
|---|---|
| (P)  | (1) Infinite order of rotational symmetry |
| (Q)  | (2) Only one line of symmetry |
| (R)  | (3) No symmetry |
| (S)  | (4) Only two lines of symmetry |

A. P-3, Q-4, R-2, S-1

B. P-3, Q-4, R-1, S-2

C. P-4, Q-3, R-2, S-1

D. P-1, Q-2, R-4, S-3

Answer: A



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Exercise Very Short Answer Type

1. State the number of lines of symmetry for an isosceles triangle.



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2. State the number of lines of symmetry for a regular hexagon.



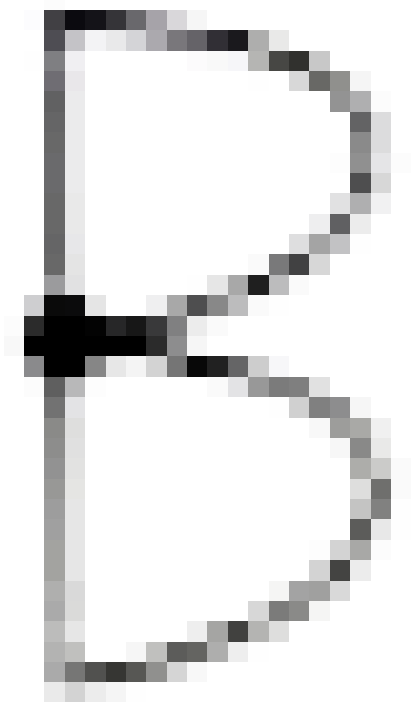
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3. Define angle of rotation.



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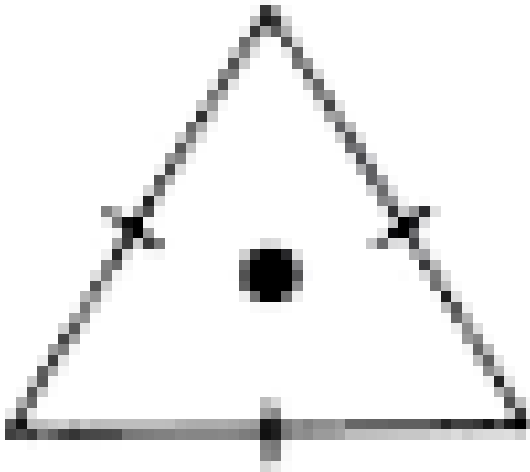
4. Give the order of the rotational symmetry of the given figure about the point marked.





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5. Give the order of the rotational symmetry of the given figure about the point marked.



.



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6. Draw the line of symmetry of the given

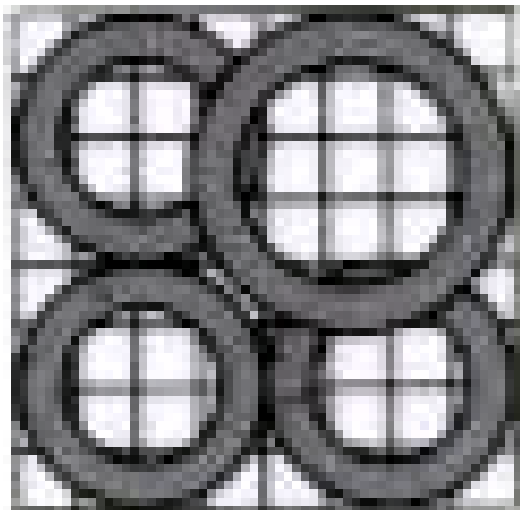


figure.



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7. Draw the line of symmetry of the given

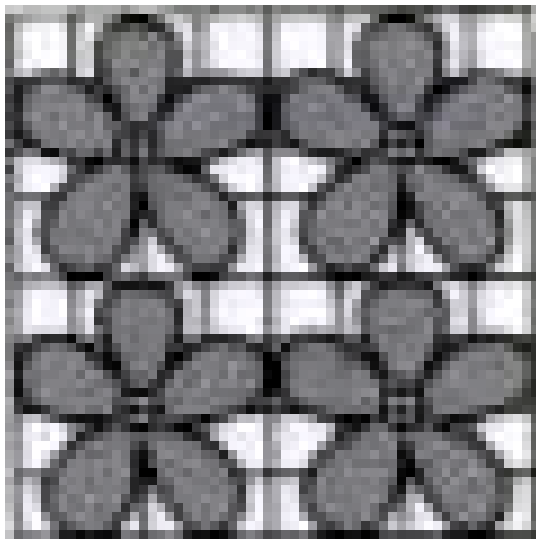


figure.



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8. Draw the line of symmetry of the given

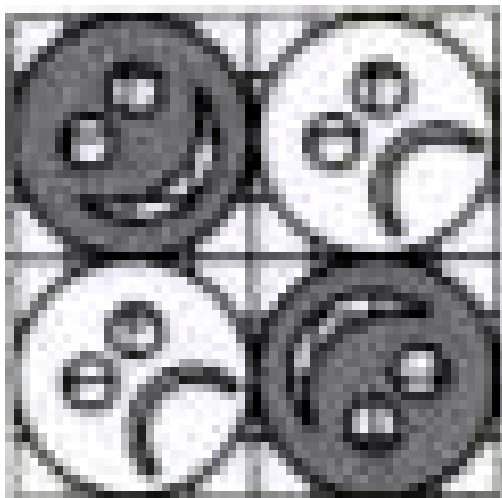


figure.



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9. Draw the line of symmetry of the given

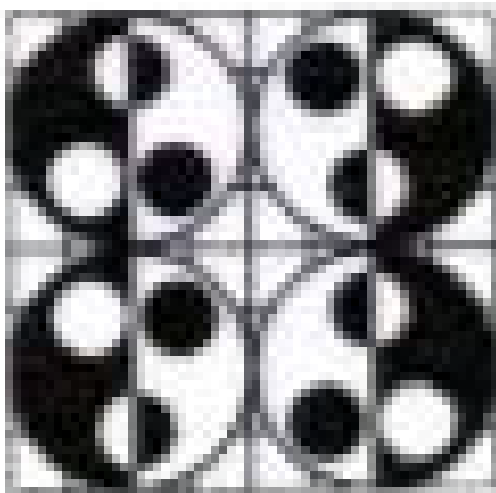


figure.



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10. Draw the line of symmetry of the given

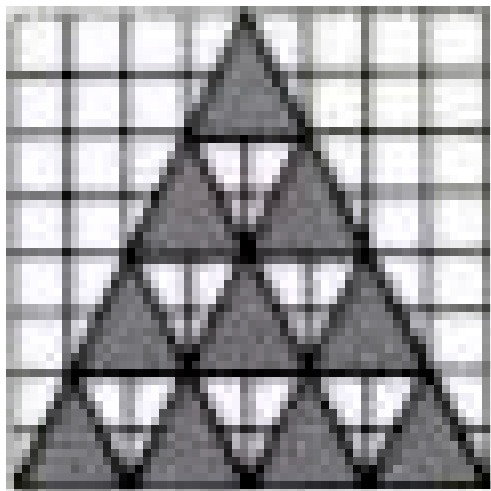


figure.



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Exercise Short Answer Type

1. Name the quadrilateral which has both line and rotational symmetry of order more than 2.



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2. Find the order of rotational symmetry of the following:

(a) A square (b) A rectangle

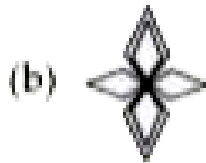
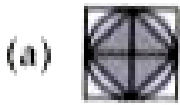
(c) A rhombus (d) An equilateral triangle

(e) A parallelogram



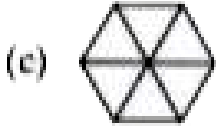
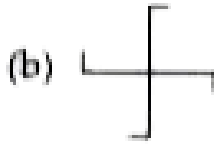
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3. For each of the following shapes, state the number of line symmetry and order of rotational symmetry.



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4. Give the order of rotational symmetry of each of the following:



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5. Which of the following letters have rotational symmetry?

R, B, F, H, O, P, S, W, X, Z, N



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6. Draw the line of symmetry of the given

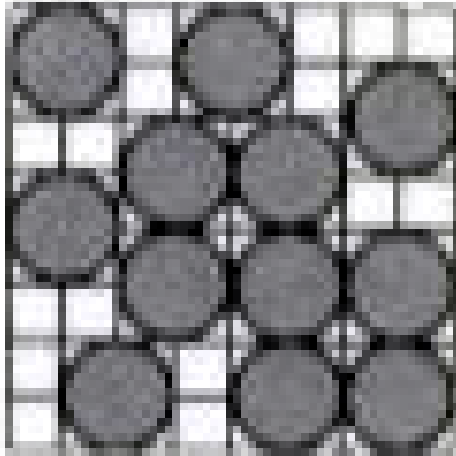


figure.



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7. Draw the line of symmetry of the given

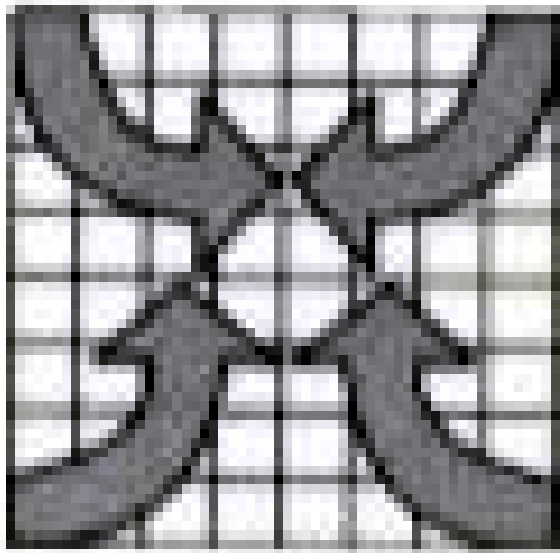


figure.



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8. Draw the line of symmetry of the given

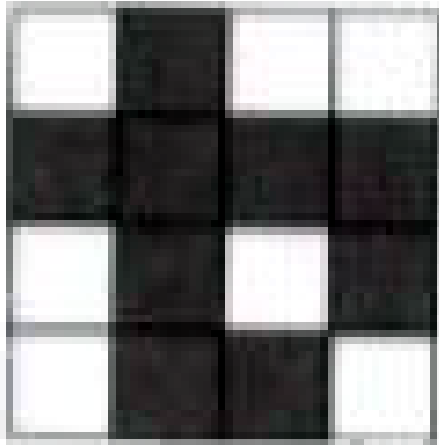


figure.



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9. Draw the line of symmetry of the given

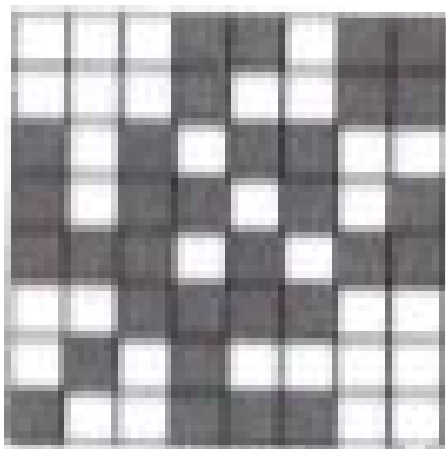


figure.



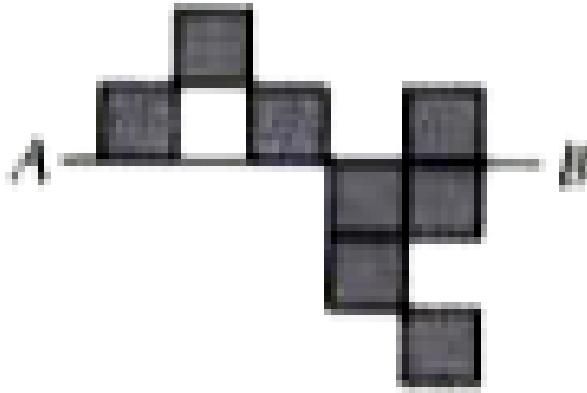
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10. What is the least number of squares that must be added so that the line AB becomes a

line

of

symmetry?



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Exercise Integer Numerical Value Type

1. A ceiling fan having 4 blades has a rotational symmetry of the order $2 \times K$. Find K.



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2. How many lines of symmetry does a regular decagon have?



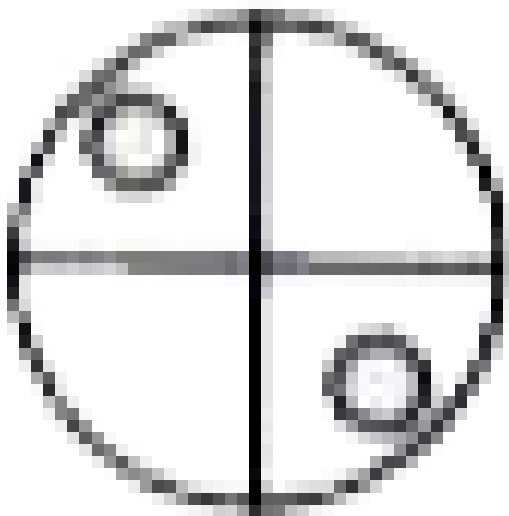
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3. Find the order of rotational symmetry in English alphabet K.



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4. Find the line of symmetry in figure given

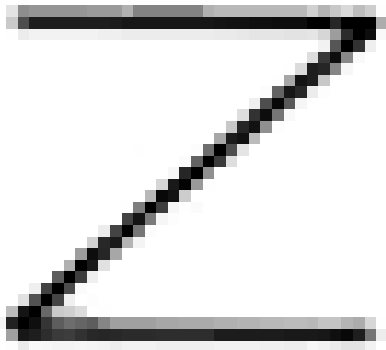


below.



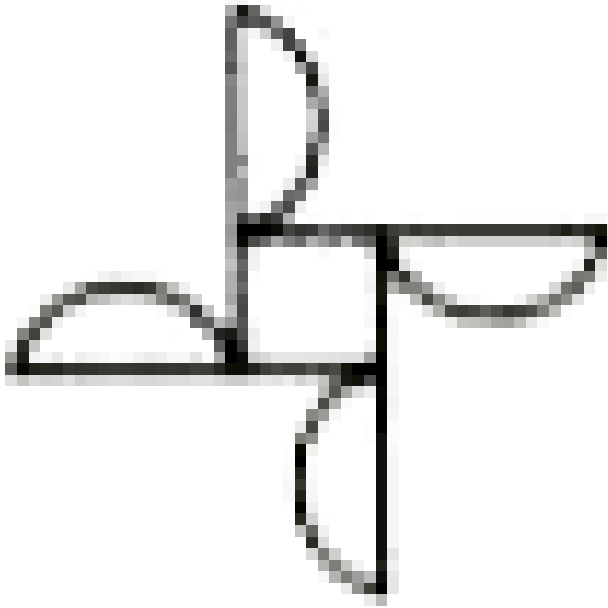
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5. What is the order of rotational symmetry of the given figure.



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1. The given figure has rotational symmetry of



order

A. 1

B. 2

C. 3

D. 4

Answer: D



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2. The number of lines of symmetry of an isosceles triangle is (a) 0 (b) 1 (c) 2 (d) 3

A. 3

B. 2

C. 1

D. 0

Answer: C



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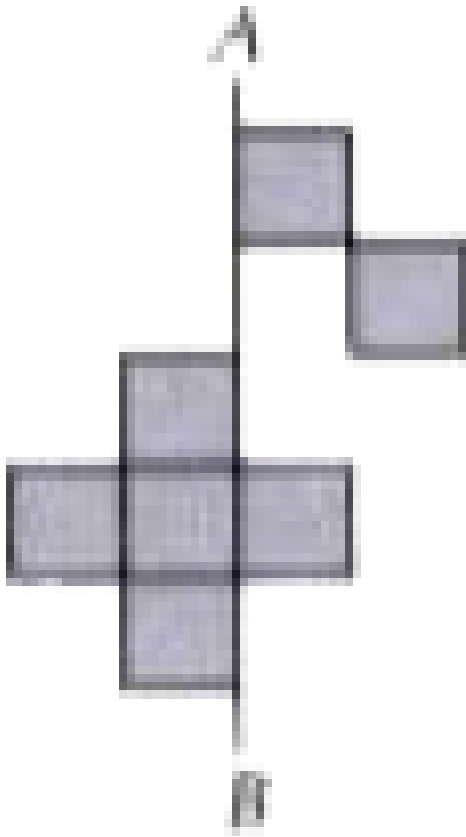
3. What is the least number of squares that must be added so that the line AB becomes

the

line

of

symmetry



A. 4

B. 5

C. 6

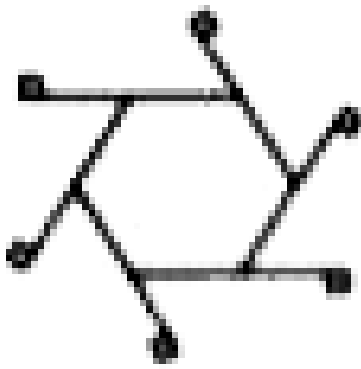
D. 7

Answer: B



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4. What is the order of rotational symmetry of the given figure



A. 2

B. 6

C. 4

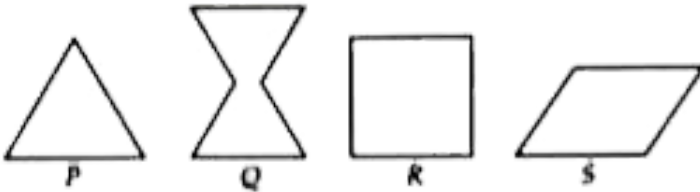
D. 0

Answer: B



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5. Which of the following figures have at least 2 lines of symmetry?



A. P and R only

B. S and P only

C. P,Q and R only

D. Q and S only

Answer: C





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