

SECTION A: MULTIPLE CHOICE QUESTIONS

In each of questions 1 to 16, out of four options, only one is correct. Write the correct answer.

Question 1. Number of lines passing through five points such that no three of them are collinear is:

- (A) 10
(B) 5
(C) 20
(D) 8

Answer: (A) 10

Solution: From the question, it is given that we need to find the number of lines passing through five points. We know that two points are required to form a line. Therefore, number of lines passing through five points = ${}_5C_2 = 10$

Question 2. The number of diagonals in a heptagon is:

- (A) 21
(B) 42
(C) 7
(D) 14

Answer: (D) 14

Solution: Using the formula: Number of diagonals = $n(n - 3)/2$ Where n = number of sides in a polygon. A heptagon has 7 sides. So, $d = 7(7 - 3)/2 = 7(4)/2 = 28/2 = 14$

Question 3. Number of line segments in the given figure is:



- (A) 5
(B) 10
(C) 15
(D) 20

Answer: (B) 10

Solution: From the figure, the line segments are: AB, AC, AD, AE, BC, BD, BE, CD, CE, DE. Therefore, there are 10 line segments in the given figure.

Question 4. Measures of the two angles between hour and minute hands of a clock at 9 O'clock are:

- (A) 60° , 300°
(B) 270° , 90°
(C) 75° , 285°
(D) 30° , 330°

Answer: (B) 270° , 90°

Solution: We know that the complete angle of a clock is 360° . From the figure:



- Angle at position 2 = $(9/12) \times 360^\circ = 270^\circ$
- Angle at position 1 = $360^\circ - 270^\circ = 90^\circ$

Therefore, the measures of the two angles are 270° and 90° .

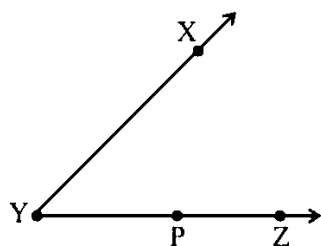
Question 5. If a bicycle wheel has 48 spokes, then the angle between a pair of two consecutive spokes is:

- (A) $5\frac{1}{2}^\circ$
 (B) $7\frac{1}{2}^\circ$
 (C) $2/11^\circ$
 (D) $2/15^\circ$

Answer: (B) $7\frac{1}{2}^\circ$

Solution: We know that a bicycle wheel is circular in shape. Total angle of wheel = 360° Given: bicycle wheel has 48 spokes Angle between consecutive spokes = $360^\circ/48 = 7.5^\circ = 7\frac{1}{2}^\circ$

Question 6. In the given figure, $\angle XYZ$ cannot be written as:

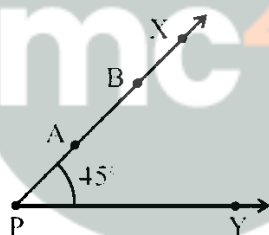


- (A) $\angle Y$
 (B) $\angle ZXY$
 (C) $\angle ZYX$
 (D) $\angle XYP$

Answer: (B) $\angle ZXY$

Solution: $\angle XYZ$ has vertex at Y, so it cannot be written as $\angle ZXY$ which has vertex at X.

Question 7. If point A is shifted to point B along the ray PX such that $PB = 2PA$, then the measure of $\angle BPY$ is:

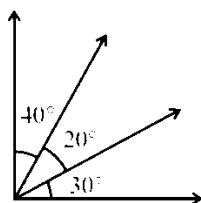


- (A) greater than 45°
 (B) 45°
 (C) less than 45°
 (D) 90°

Answer: (B) 45°

Solution: As per the given condition, point A is shifted to point B along ray PX such that $PB = 2PA$. By shifting point 'A', there is no change at point 'P'. Therefore, the measure of $\angle BPY$ remains 45° .

Question 8. The number of angles in the given figure is:



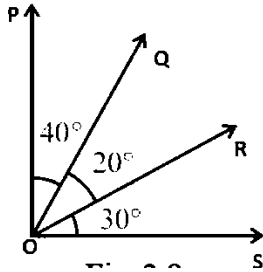
- (A) 3
 (B) 4

(C) 5

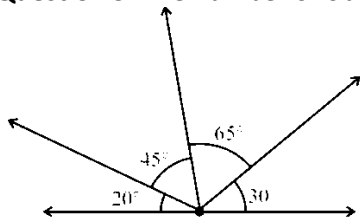
(D) 6

Answer: (D) 6

Solution: From the figure, the angles are: $\angle POS$, $\angle QOS$, $\angle ROS$, $\angle POQ$, $\angle QOR$, $\angle POR$ Therefore, the number of angles formed is 6.



Question 9. The number of obtuse angles in the given figure is:



(A) 2

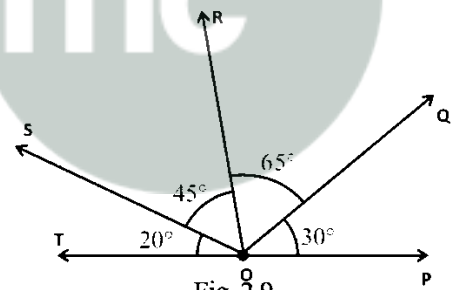
(B) 3

(C) 4

(D) 5

Answer: (C) 4

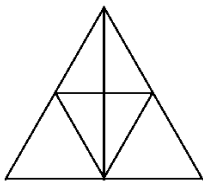
Solution: An obtuse angle is greater than 90° and less than 180° . From the figure:



- $\angle ROP = \angle ROQ + \angle QOP = 65^\circ + 30^\circ = 95^\circ$ (obtuse)
- $\angle SOP = \angle ROQ + \angle QOP + \angle SOR = 65^\circ + 30^\circ + 45^\circ = 140^\circ$ (obtuse)
- $\angle SOQ = \angle SOR + \angle ROQ = 45^\circ + 65^\circ = 110^\circ$ (obtuse)
- $\angle TOQ = \angle TOS + \angle SOR + \angle ROQ = 20^\circ + 45^\circ + 65^\circ = 130^\circ$ (obtuse)

Therefore, the number of obtuse angles is 4.

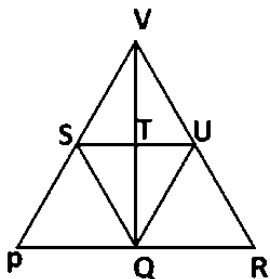
Question 10. The number of triangles in the given figure is:



- (A) 10
 (B) 12
 (C) 13
 (D) 14

Answer: (C) 13

Solution:



By observing the figure, there are 13 triangles:

ΔPVR , ΔPSQ , ΔSQV , ΔSQT , ΔTQU , ΔQUR , ΔVSU , ΔVST , ΔVTU , ΔPQV , ΔRQV , ΔVSQ , ΔVUQ

Question 11. If the sum of two angles is greater than 180° , then which of the following is not possible?

- (A) One obtuse angle and one acute angle
 (B) One reflex angle and one acute angle
 (C) Two obtuse angles
 (D) Two right angles

Answer: (D) Two right angles

Solution: The sum of two right angles = $90^\circ + 90^\circ = 180^\circ$ Since 180° is not greater than 180° , two right angles is not possible.

Question 12. If the sum of two angles is equal to an obtuse angle, then which of the following is not possible?

- (A) One obtuse angle and one acute angle
 (B) One right angle and one acute angle
 (C) Two acute angles
 (D) Two right angles

Answer: (D) Two right angles

Solution: The sum of two right angles = $90^\circ + 90^\circ = 180^\circ$ Since 180° is a straight angle, not an obtuse angle ($90^\circ < \text{obtuse} < 180^\circ$), two right angles is not possible.

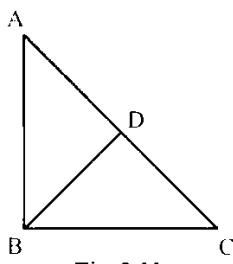
Question 13. A polygon has prime number of sides. Its number of sides is equal to the sum of the two least consecutive primes. The number of diagonals of the polygon is:

- (A) 4
 (B) 5
 (C) 7
 (D) 10

Answer: (B) 5

Solution: The two least consecutive prime numbers are 2 and 3. Sum = $2 + 3 = 5$ Using the formula:
 Number of diagonals = $n(n - 3)/2 = 5(5 - 3)/2 = 5(2)/2 = 5$

Question 14. In the given figure, $AB = BC$ and $AD = BD = DC$. The number of isosceles triangles is:



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

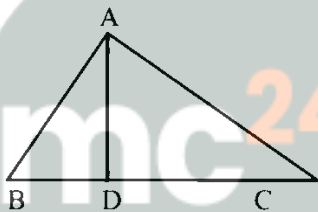
Answer: (C) 3

Solution: From the given conditions:

- $\triangle ABC$ is isosceles ($AB = BC$)
- $\triangle ABD$ is isosceles ($AD = BD$)
- $\triangle CBD$ is isosceles ($BD = DC$)

Therefore, there are 3 isosceles triangles.

Question 15. In the given figure, $\angle BAC = 90^\circ$ and $AD \perp BC$. The number of right triangles is:



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

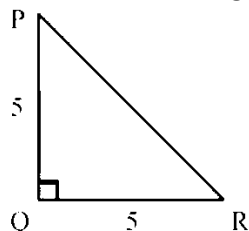
Answer: (C) 3

Solution: From the given conditions:

- $\triangle ABC$ is a right triangle ($\angle BAC = 90^\circ$)
- $\triangle ABD$ is a right triangle ($AD \perp BC$, so $\angle ADB = 90^\circ$)
- $\triangle ADC$ is a right triangle ($AD \perp BC$, so $\angle ADC = 90^\circ$)

Therefore, there are 3 right triangles.

Question 16. In the given figure, $PQ \perp RQ$, $PQ = 5$ cm and $QR = 5$ cm. Then $\triangle PQR$ is:



- (A) a right triangle but not isosceles
(B) an isosceles right triangle

- (C) isosceles but not a right triangle
 (D) neither isosceles nor right triangle

Answer: (B) an isosceles right triangle

Solution: Given: $PQ \perp RQ$ (makes it a right triangle), $PQ = 5$ cm and $QR = 5$ cm (makes it isosceles)
 Since $PQ = QR$ and $\angle PQR = 90^\circ$, ΔPQR is an isosceles right triangle.

SECTION B: FILL IN THE BLANKS

In questions 17 to 31, fill in the blanks to make the statements true.

Question 17. An angle greater than 180° and less than a complete angle is called _____.

Answer: reflex angle

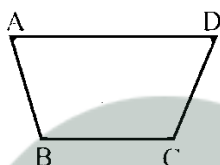
Question 18. The number of diagonals in a hexagon is _____.

Answer: 9

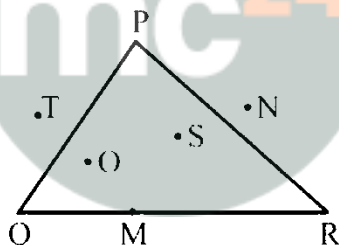
Solution: A hexagon has 6 sides. Number of diagonals = $n(n - 3)/2 = 6(6 - 3)/2 = 6(3)/2 = 9$

Question 19. A pair of opposite sides of a trapezium are _____.

Answer: parallel



Question 20. In the given figure, points lying in the interior of triangle PQR are _____, that in the exterior are _____, and that on the triangle itself are _____.

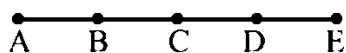


Answer: O and S; N and T; M, P, Q and R

Question 21. In the given figure, points A, B, C, D and E are collinear such that $AB = BC = CD = DE$.

Then:

- (a) $AD = AB + \underline{\hspace{2cm}}$
- (b) $AD = AC + \underline{\hspace{2cm}}$
- (c) midpoint of AE is _____
- (d) midpoint of CE is _____
- (e) $AE = \underline{\hspace{2cm}} \times AB$

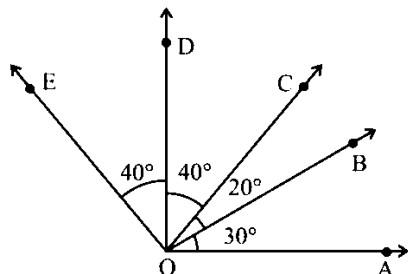


- Answers:** (a) BD (where $BD = BC + CD$)
 (b) CD
 (c) C

- (d) D
(e) 4

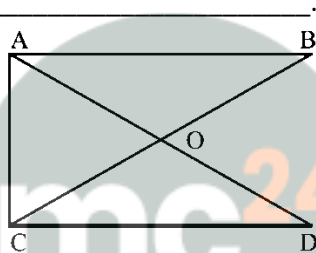
Question 22. In the given figure:

- (a) $\angle AOD$ is a/an _____ angle
(b) $\angle COA$ is a/an _____ angle
(c) $\angle AOE$ is a/an _____ angle



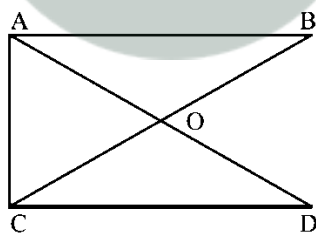
- Answers:** (a) **right** ($\angle AOD = 30^\circ + 20^\circ + 40^\circ = 90^\circ$)
(b) **acute** ($\angle COA = 20^\circ + 30^\circ = 50^\circ$)
(c) **obtuse** ($\angle AOE = 40^\circ + 40^\circ + 20^\circ + 30^\circ = 130^\circ$)

Question 23. The number of triangles in the given figure is _____. Their names are _____.



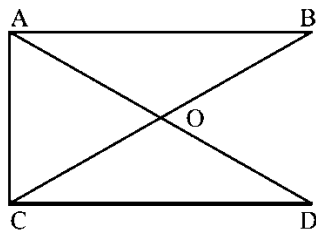
Answer: 5; $\triangle AOC$, $\triangle COD$, $\triangle AOB$, $\triangle ACB$, $\triangle ACD$

Question 24. Number of angles less than 180° in the given figure is _____ and their names are _____.



Answer: 12; $\angle OAB$, $\angle OBA$, $\angle OAC$, $\angle OCA$, $\angle OCD$, $\angle ODC$, $\angle AOB$, $\angle AOC$, $\angle COD$, $\angle DOB$, $\angle BAC$, $\angle ACD$

Question 25. The number of straight angles in the given figure is _____.



Answer: 4 ($\angle AOD$, $\angle BOC$, $\angle COB$, $\angle DOA$)

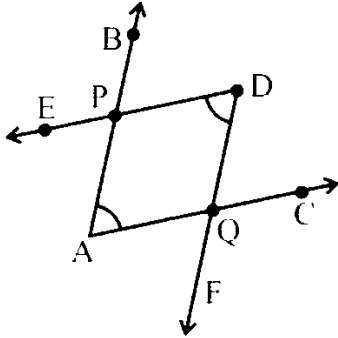
Question 26. The number of right angles in a straight angle is _____, and that in a complete angle is _____.

Answer: 2; 4

Solution:

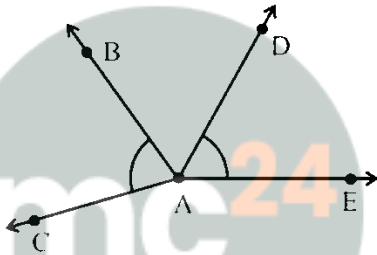
- Straight angle = 180° , Right angle = 90° , so $180^\circ \div 90^\circ = 2$
- Complete angle = 360° , so $360^\circ \div 90^\circ = 4$

Question 27. The number of common points in the two angles marked in the given figure is _____.



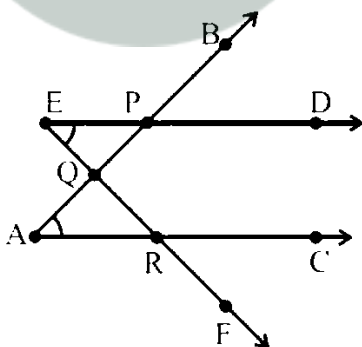
Answer: 2 (points P and Q)

Question 28. The number of common points in the two angles marked in the given figure is _____.



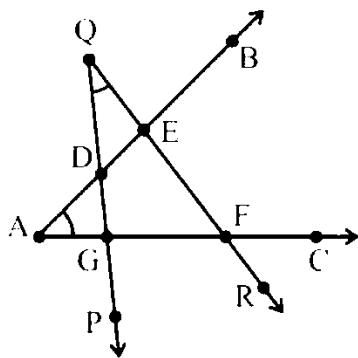
Answer: 1 (point A)

Question 29. The number of common points in the two angles marked in the given figure is _____.



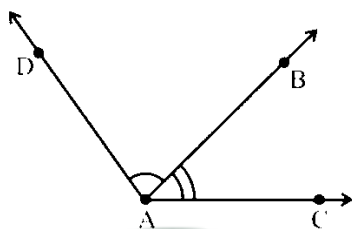
Answer: 3 (points P, Q and R)

Question 30. The number of common points in the two angles marked in the given figure is _____.



Answer: 4 (points D, E, F and G)

Question 31. The common part between the two angles BAC and DAB in the given figure is _____.



Answer: ray AB

SECTION C: TRUE/FALSE

State whether the statements given in questions 32 to 41 are true (T) or false (F).

Question 32. A horizontal line and a vertical line always intersect at right angles.

Answer: True

Question 33. If the arms of an angle on the paper are increased, the angle increases.

Answer: False

Explanation: The angle measure is not affected by the length of its arms.

Question 34. If the arms of an angle on the paper are decreased, the angle decreases.

Answer: False

Explanation: The angle measure is not affected by the length of its arms.

Question 35. If line $PQ \parallel$ line m , then line segment $PQ \parallel$ m .

Answer: True

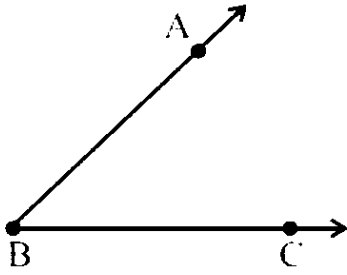
Explanation: If two lines are parallel, then any segments of those lines are also parallel.

Question 36. Two parallel lines meet each other at some point.

Answer: False

Explanation: Parallel lines never intersect.

Question 37. Measures of $\angle ABC$ and $\angle CBA$ in the given figure are the same.



Answer: True

Explanation: Both angles have the same vertex B and the same arms.

Question 38. Two line segments may intersect at two points.

Answer: False

Explanation: Two line segments can intersect at most at one point.

Question 39. Many lines can pass through two given points.

Answer: False

Explanation: Only one unique line can pass through two given points.

Question 40. Only one line can pass through a given point.

Answer: False

Explanation: Infinite number of lines can pass through a single point.

Question 41. Two angles can have exactly five points in common.

Answer: False

Explanation: Two angles can have at most two points in common (when they share a common arm).

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