

EXERCISE

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

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

Solution:-

(A) 10

From the question it is given that, number of lines passing through five points.

We know that, we need two points to form a line.

Therefore, number of lines passing through five points = 5×2
= 10

2. The number of diagonals in a heptagon is

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

Solution:-

(D) 14

From the formula, diagonal = $n(n - 3)/2$

Where n = number of sides in a polygon.

There are 7 sides in a heptagon.

So, $d = 7(7 - 3)/2$
= $7(4)/2$
= $28/2$
= 14

3. Number of line segments in Fig. 2.5 is

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



Fig. 2.5

Solution:-

(B) 10

From the figure, number of line segments are, AB, AC, AD, AE, BC, BD, BE, CD, CE, DE.

Therefore, there are 10 line segments in the given figure.

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

(A) 60° , 300°

(C) 75° , 285°

(B) 270° , 90°

(D) 30° , 330°

Solution:-

(B) 270° , 90°

We know that, measure of complete angle of clock is 360° .



From the figure, we can say that angle at 2 = $(9/12) \times 360^\circ = 270^\circ$

Then, angle at 1 = $360^\circ - 270^\circ$
= 90°

Therefore, measures of the two angles between hour and minute hands of a clock at 9 O' clock are 270° and 90° .

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

(A) $5\frac{1}{2}$

(B) $7\frac{1}{2}$

(c) $2/11$

(D) $2/15$

Solution:-

(B) $7\frac{1}{2}$

We know that, bicycle wheel is in circular shape.

So, total angle of wheel is 360° .

From the question it is given that bicycle wheel has 48 spokes.

Then, the angle between a pair of two consecutive spokes is = $360^\circ/48$
= 7.5
= $7\frac{1}{2}$

6. In Fig. 2.6, $\angle XYZ$ cannot be written as

(A) $\angle Y$

(B) $\angle ZXY$

(C) $\angle ZYX$

(D) $\angle XYP$

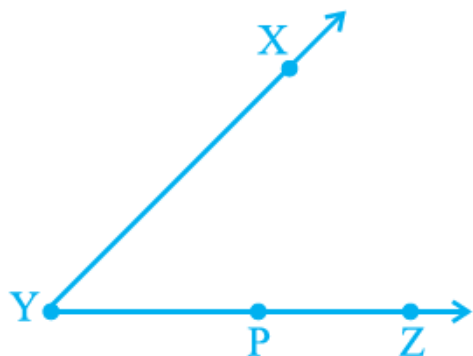


Fig. 2.6

Solution:-

(B) $\angle ZXY$

7. In Fig 2.7, 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°

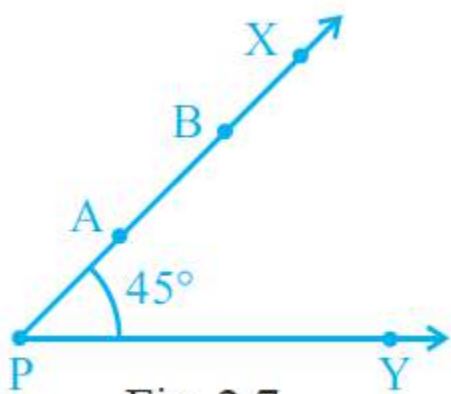


Fig. 2.7

Solution:-

(B) 45°

As per the condition given the question, point A is shifted to point B along the ray PX such that $PB = 2PA$.

So, by shifting the point 'A' there is no change at the point 'P'.

Therefore, the measure of $\angle BPY$ is 45° .

8. The number of angles in Fig. 2.8 is

(A) 3

(B) 4

(C) 5

(D) 6

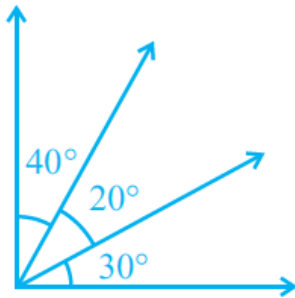


Fig. 2.8

Solution:-

(D) 6

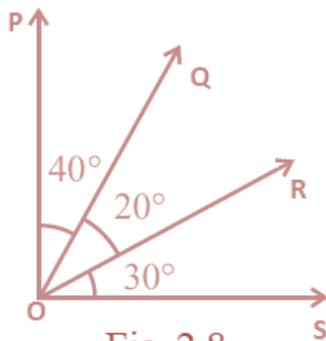


Fig. 2.8

From the above figure,
Angle are, $\angle POS$, $\angle QOS$, $\angle ROS$, $\angle POQ$, $\angle QOR$, $\angle ROS$.
Therefore, number of angle formed are 6.

9. The number of obtuse angles in Fig. 2.9 is

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

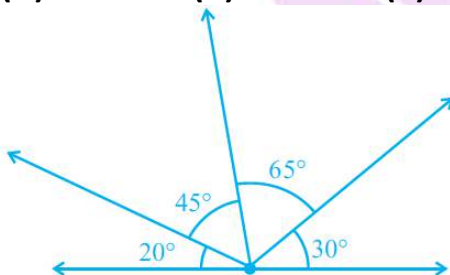


Fig. 2.9

Solution:-

(c) 4

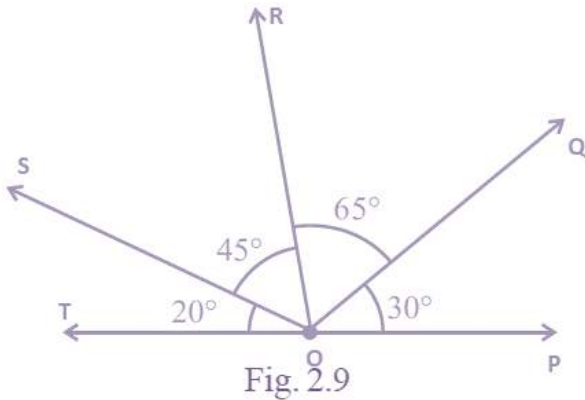


Fig. 2.9

Obtuse angle is defined as an angle formed is greater than 90° and less than 180° .

From the above figure,

$$\begin{aligned}\text{Angle are, } \angle ROP &= \angle ROQ + \angle QOP \\ &= 65^\circ + 30^\circ \\ &= 95^\circ\end{aligned}$$

$$\begin{aligned}\angle SOP &= \angle ROQ + \angle QOP + \angle SOR \\ &= 65^\circ + 30^\circ + 45^\circ \\ &= 140^\circ\end{aligned}$$

$$\begin{aligned}\angle SOQ &= \angle SOR + \angle ROQ \\ &= 45^\circ + 65^\circ \\ &= 110^\circ\end{aligned}$$

$$\begin{aligned}\angle TOQ &= \angle TOS + \angle SOR + \angle ROQ \\ &= 20^\circ + 45^\circ + 65^\circ \\ &= 130^\circ\end{aligned}$$

Therefore, number of obtuse angle formed are 4.

10. The number of triangles in Fig. 2.10 is

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

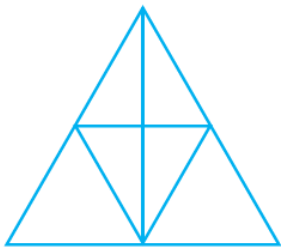
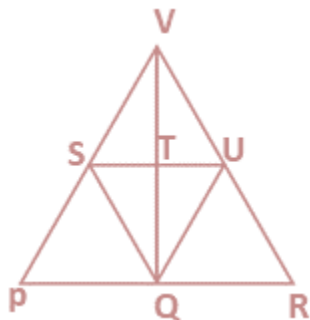


Fig. 2.10

Solution:-

(C) 13



By observing the above figure, there are 13 triangles.

$\triangle PVR$, $\triangle PSQ$, $\triangle SQU$, $\triangle SQT$, $\triangle TQU$, $\triangle QUR$, $\triangle VSU$, $\triangle VST$, $\triangle VTU$, $\triangle PQV$, $\triangle RQV$, $\triangle VSQ$, $\triangle VUQ$

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

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

Solution: -

(D) Two right angles.

Because, sum of all angles of right angles is must be equal to 180° .

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.

Solution:-

(D) Two right angles.

Because, sum of all angles of right angles is must be equal to 180° .

Right angle triangle does not contain obtuse angle.

Obtuse angle is defined as an angle formed is greater than 90° and less than 180° .

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

Solution:-

(B) 5

The two least consecutive prime numbers are, 2 and 3

Sum of two numbers = $2 + 3 = 5$

By using formula = $n(n - 3)/2$

$$= 5(5 - 3)/2$$

$$= (5 \times 2)/2$$

$$= 10/2$$

$$= 5$$

14. In Fig. 2.11, $AB = BC$ and $AD = BD = DC$. The number of isosceles triangles in the figure is

(A) 1

(B) 2

(C) 3

(D) 4

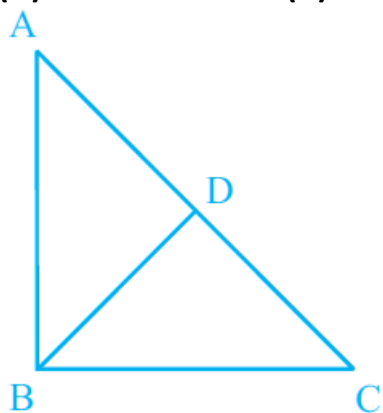


Fig. 2.11

Solution:-

(C) 3

From the figure, $\triangle ABC$, $\triangle ABD$ and $\triangle CBD$ are isosceles triangle.

15. In Fig. 2.12, $\angle BAC = 90^\circ$ and $AD \perp BC$. The number of right triangles in the figure is

(A) 1

(B) 2

(C) 3

(D) 4

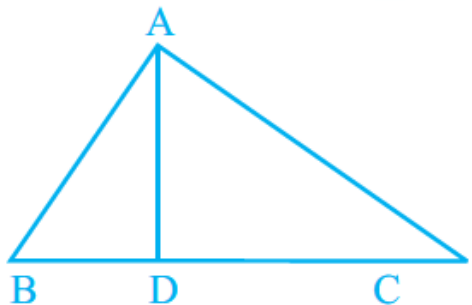


Fig. 2.12

Solution:-

(C) 3

From the figure, $\triangle ABC$, $\triangle ABD$ and $\triangle ADC$ are right triangle.

16. In Fig. 2.13, $PQ \perp RQ$, $PQ = 5$ 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

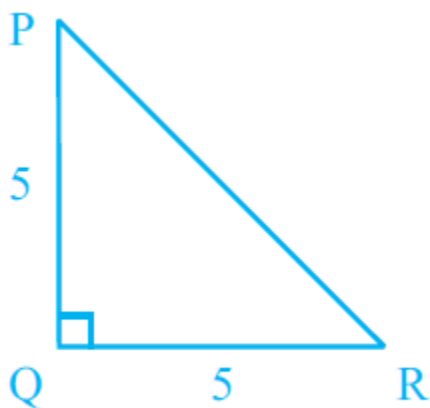


Fig. 2.13

Solution:-

(B) an isosceles right triangle

From the question it is given that, $PQ \perp RQ$, $PQ = 5$ cm and $QR = 5$ cm.

We know that, isosceles triangle has two equal side.

Therefore, the given $\triangle PQR$ is an isosceles right triangle.

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

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

Solution:-

An angle greater than 180° and less than a complete angle is called reflex angle.

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

Solution:-

The number of diagonals in a hexagon is 9.

We know that, hexagon has 6 sides.

$$\begin{aligned} \text{By using the formula, number of diagonals} &= \frac{n(n-3)}{2} \\ &= \frac{6(6-3)}{2} \\ &= \frac{6(3)}{2} \end{aligned}$$

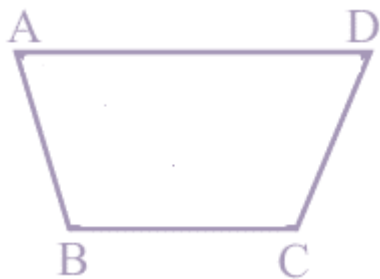
$$= 18/2$$

$$= 9$$

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

Solution:-

A pair of opposite sides of a trapezium are parallel.



20. In Fig. 2.14, points lying in the interior of the triangle PQR are _____, that in the exterior are _____ and that on the triangle itself are _____.

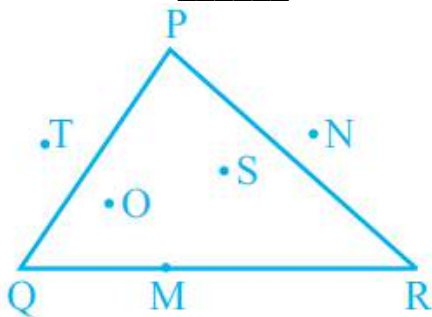


Fig. 2.14

Solution:-

In Fig. 2.14, points lying in the interior of the triangle PQR are O and S, that in the exterior are N and T and that on the triangle itself are M, P, Q and R.

21. In Fig. 2.15, 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) mid point of AE is _____

(d) mid point of CE is _____

(e) $AE = \underline{\hspace{2cm}} \times AB$.



Fig. 2.15

Solution:-

(a) $AD = AB + \underline{BD}$

Where, $BD = BC + CD$

(b) $AD = AC + \underline{CD}$

(c) mid point of AE is C

(d) mid point of CE is D

(e) $AE = \underline{4} \times AB$. [given]

22. In Fig. 2.16,

(a) $\angle AOD$ is a/an _____ angle

(b) $\angle COA$ is a/an _____ angle

(c) $\angle AOE$ is a/an _____ angle

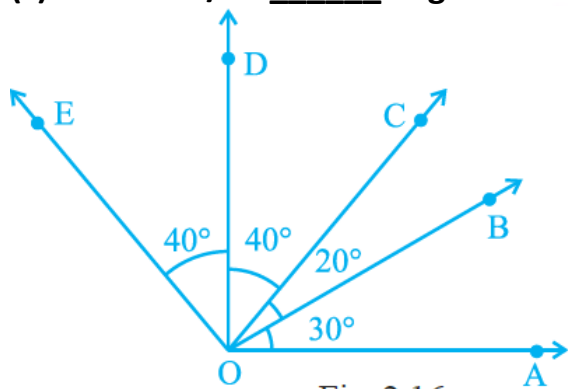


Fig. 2.16

Solution:-

From the figure,

(a) $\angle AOD$ is a/an right angle.

Is anyone angle in the triangle is equal to 90° then the triangle is called right triangle.

$$\angle AOD = \angle AOB + \angle BOC + \angle COD$$

$$= 30^\circ + 20^\circ + 40^\circ$$

$$= 90^\circ$$

(b) $\angle COA$ is a/an acute angle

An acute angle is an angle formed between 0° to 90° .

$$\angle COA = \angle COB + \angle BOA$$

$$= 20^\circ + 30^\circ$$

$$= 50^\circ$$

(c) $\angle AOE$ is a/an obtuse angle

An obtuse angle is an angle formed between 90° to 180° .

$$\begin{aligned}\angle AOE &= \angle EOD + \angle DOC + \angle COB + \angle BOA \\ &= 40^\circ + 40^\circ + 20^\circ + 30^\circ \\ &= 130^\circ\end{aligned}$$

23. The number of triangles in Fig. 2.17 is _____. Their names are

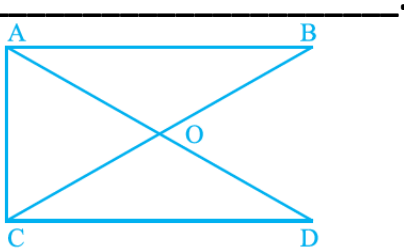


Fig. 2.17

Solution:-

The number of triangles in Fig. 2.17 is 5. Their names are $\triangle AOC$, $\triangle COD$, $\triangle AOB$, $\triangle ACB$, $\triangle ACD$.

24. Number of angles less than 180° in Fig. 2.17 is _____ and their names are _____.

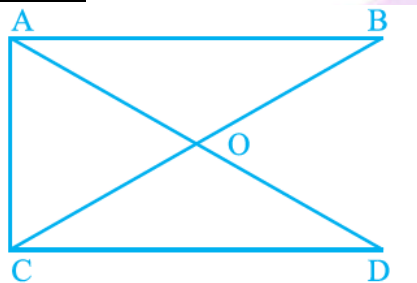


Fig. 2.17

Solution:-

Number of angles less than 180° in Fig. 2.17 is 12 and their names are $\angle OAB$, $\angle OBA$, $\angle OAC$, $\angle OCA$, $\angle OCD$, $\angle ODC$, $\angle AOB$, $\angle AOC$, $\angle COD$, $\angle DOB$, $\angle BAC$, $\angle ACD$.

25. The number of straight angles in Fig. 2.17 is _____.

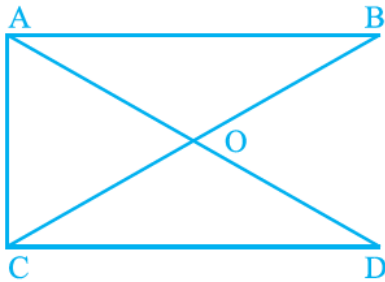


Fig. 2.17

Solution:-

The number of straight angles in Fig. 2.17 is four.

The angles are, $\angle AOD$, $\angle BOC$, $\angle COB$, $\angle DOA$.

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

Solution:-

The number of right angles in a straight angle is two and that in a complete angle is four.

We know that, angle formed by straight angle = 180°

and angle formed by right angle = 90°

So, number of right angles = $180^\circ / 90^\circ = 2$

We know that, complete angle = 360°

So, number of right angles = $360^\circ / 90^\circ = 4$

27. The number of common points in the two angles marked in Fig. 2.18 is _____.

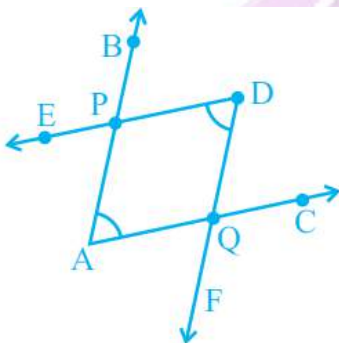


Fig. 2.18

Solution:-

The number of common points in the two angles marked in Fig. 2.18 is two.

From the given figure, the common points are P and Q.

28. The number of common points in the two angles marked in Fig. 2.19 is _____.

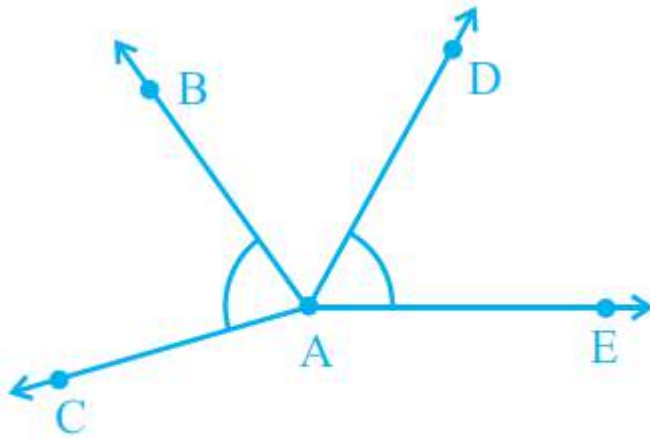


Fig. 2.19

Solution:-

The number of common points in the two angles marked in Fig. 2.19 is one.
From the given figure, the common point is A.

29. The number of common points in the two angles marked in Fig. 2.20 _____ .

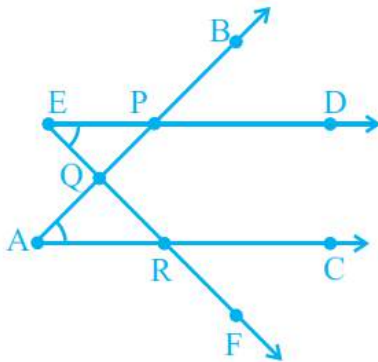


Fig. 2.20

Solution:-

The number of common points in the two angles marked in Fig. 2.20 three.
From the given figure, the common points are P, Q and R.

30. The number of common points in the two angles marked in Fig. 2.21 is _____ .

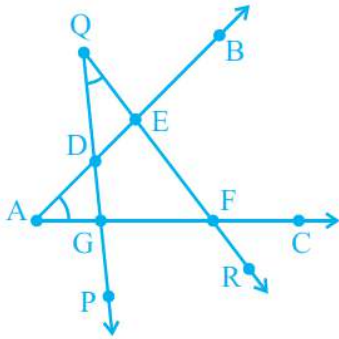


Fig. 2.21

Solution:-

The number of common points in the two angles marked in Fig. 2.21 is four.
From the given figure, the common points are D, E, F and G.

31. The common part between the two angles BAC and DAB in Fig. 2.22 is _____.

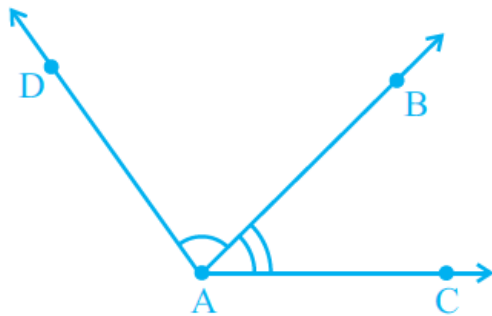


Fig. 2.22

Solution:-

The common part between the two angles BAC and DAB in Fig. 2.22 is ray AB.

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

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

Solution:-

True.

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

Solution:-

False.

The angle is not affected, if the arms of an angle on the paper are increased or decreased.

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

Solution:-

False.

The angle is not affected, if the arms of an angle on the paper are increased or decreased.

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

Solution:-

True.

From the question, line $PQ \parallel$ line m .

Then, parts of those lines are also parallel.

Therefore, line segment $PQ \parallel$ m .

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

Solution:-

False.

Parallel lines never meet each other.

37. Measures of $\angle ABC$ and $\angle CBA$ in Fig. 2.23 are the same.

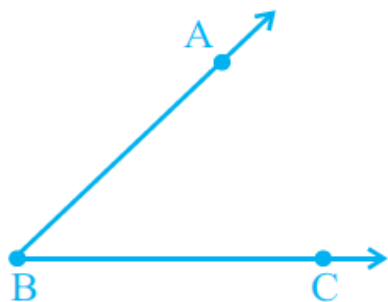


Fig. 2.23

Solution:-

True.

From the figure, both $\angle ABC$ and $\angle CBA$ contains common angle B.

38. Two line segments may intersect at two points.

Solution:-

False.

Because, two line segments are intersecting at only one point.

39. Many lines can pass through two given points.

Solution:-

False.

only one line can pass through two given points.

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

Solution:-

False.

Infinite number of line can pass through a given point.

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

Solution:-

False.

Two angles can have either one or two five points in common.

