

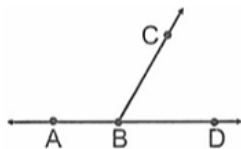
- a) CD
- b) EF
- c) GH
- d) IJ

8. The longest line in the following figure is [1]



- a) CE
- b) BF
- c) AC
- d) BD

9. Which of the following is NOT drawn in the given figure? [1]



- a) Line segment CD
- b) Ray BD
- c) Line AD
- d) Angle B

10. Match the following: [1]

(a) Has two end points	(i) Ray
(b) Has no end points	(ii) Line segment
(c) Has only one end point	(iii) Line

- a) (a) - (ii), (b) - (i), (c) - (iii)
- b) (a) - (iii), (b) - (i), (iii) - (ii)
- c) (a) - (ii), (b) - (iii), (c) - (i)
- d) (a) - (iii), (b) - (ii), (c) - (i)

11. A line has _____ end points. [1]

- a) No
- b) Two
- c) One
- d) Infinite

12. A ray has _____ end point. [1]

- a) Three
- b) Two
- c) One
- d) Zero

13. Which of the following statement is correct about line. [1]

- A. A line has no end points.
- B. A line does not have a definite length.

- a) Both A and B is correct
- b) Only A is correct
- c) Only B is correct
- d) None of these correct

14. Which of the following statement is correct about line segment. [1]

- A. A line segment has two end points.
 B. A line segment has a definite length.

- a) Both A and B is correct
 b) None of these are correct
 c) Only A is correct
 d) Only B is correct

15. Which of the following extends endlessly in both directions? [1]

- a) Point
 b) Segment
 c) Line
 d) Ray

16. A line segment has: [1]

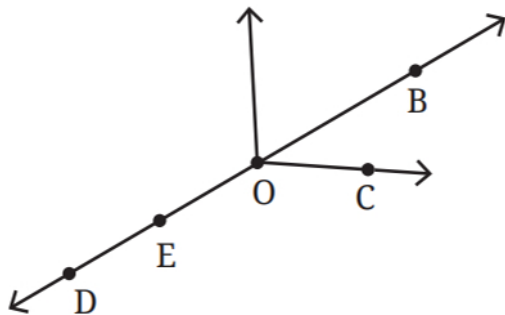
- a) Infinite endpoints
 b) Two endpoints
 c) No endpoints
 d) One endpoint

17. Match the following: [2]

Column A	Column B
(a) Point	(i) Infinite length, no endpoints
(b) Line segment	(ii) Has one endpoint
(c) Ray	(iii) Has two endpoints
(d) Line	(iv) Has no dimension

18. In Fig., name: [1]

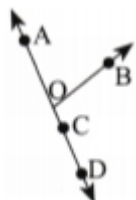
- a. Five points
 b. A line
 c. Four rays
 d. Five line segments



19. Draw a rough figure and write labels appropriately to illustrate each of the following: [2]

- a. \leftrightarrow and \leftrightarrow meet at O.
 \rightarrow and \leftrightarrow
 b. XY and PQ intersect at point M.
 c. Line l contains points E and F but not point D.
 d. Point P lies on AB.

20. Look at the figure and name the following: [3]



- i. A line.
- ii. Four line segments with a common end-point.
- iii. Four rays having same starting points.
- iv. Five points.

21. What are parallel and perpendicular lines? Give examples. [3]

22. **Read the following text carefully and answer the questions that follow:** [4]

Rohan is using a compass to draw circles in his geometry class. He notices that when he opens the compass, the two arms form an angle. He wonders how the size of the angle affects the circle he draws. He also observes that the compass can form different types of angles, such as acute, obtuse, and right angles.

- a. What is the vertex of the angle formed by the compass arms? (1)
- b. If Rohan opens the compass to form a right angle, what is the measure of this angle in degrees? (1)
- c. Explain how the size of the angle formed by the compass arms affects the circle drawn. (2)

OR

If Rohan opens the compass to form an angle of 45° , what type of angle is this? Justify your answer. (2)

23. **Assertion (A):** Two lines that never meet are called parallel lines. [1]

Reason (R): Parallel lines are always the same distance apart.

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

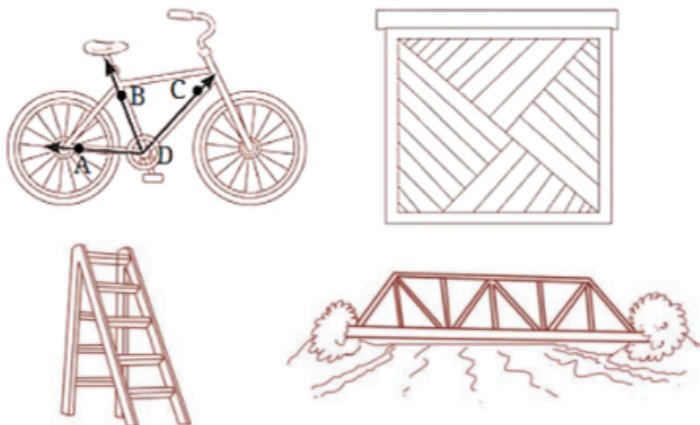
24. An angle is a figure formed by two: [1]

- a) Segments
- b) Rays
- c) Points
- d) Lines

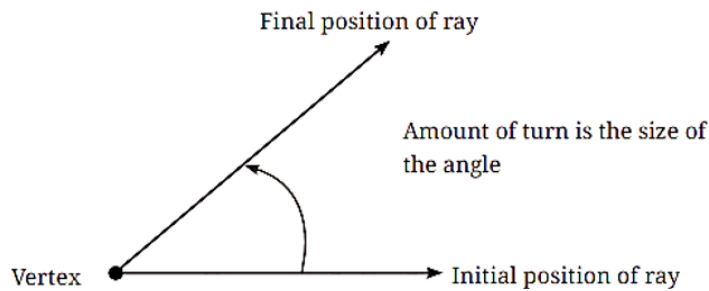
25. Match the following: [2]

Column A	Column B
(a) Right angle	(i) More than 180°
(b) Acute angle	(ii) Exactly 180°
(c) Reflex angle	(iii) Exactly 90°
(d) Straight angle	(iv) Less than 90°

26. Can you find the angles in the given pictures? Draw the rays forming any one of the angles and name the vertex of the angle. [1]



27. Mark any three points on your paper that are not on one line. Label them A, B, C. Draw all possible lines going through pairs of these points. How many lines do you get? Name them. How many angles can you name using A, B, C? Write them down, and mark each of them with a curve as in Fig. [1]



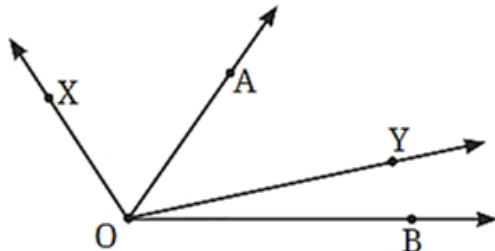
28. What is the vertex of an angle? [2]
 29. What are the arms of an angle? [2]
 30. Why do we need to name angles properly? Explain with examples. [5]
 31. **Assertion (A):** A right angle measures exactly 90 degrees. [1]

Reason (R): A right angle is formed when two perpendicular lines intersect.

- a) Both A and R are true and R is the correct explanation of A. [2]
 b) Both A and R are true but R is not the correct explanation of A. [2]
 c) A is true but R is false. [5]
 d) A is false but R is true. [1]
32. If two angles are such that one is greater than the other, we say: [1]

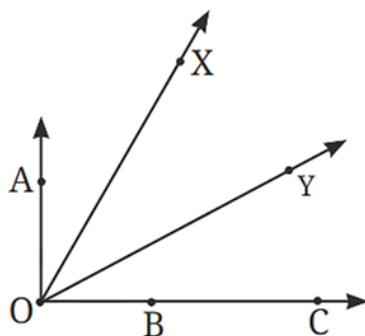
- a) They are equal [1]
 b) One angle is larger [1]
 c) They are complementary [1]
 d) They are supplementary [1]

33. Which angle is greater: $\angle XOY$ or $\angle AOB$? Give reasons. [1]



34. What do you understand by comparing angles? [2]
 35. In each case, determine which angle is greater and why. [2]
 a. $\angle AOB$ or $\angle XOY$
 b. $\angle AOB$ or $\angle XOB$
 c. $\angle XOB$ or $\angle XOC$

Discuss with your friends on how you decided which one is greater.



36. How can you compare two angles without using a protractor? [3]
 37. Why is it important to compare angles? How can we do it without a protractor? [5]

38. **Read the following text carefully and answer the questions that follow:** [4]

A door in Riya's house can swing open to form different angles. Riya notices that the door can form acute, obtuse, and right angles depending on how far it is opened. She wants to measure these angles using a protractor. For example, a slightly open door forms an acute angle, a halfway open door forms a right angle (90 degrees), and a widely open door forms an obtuse angle. Riya uses her protractor to measure and understand these angles better.

- What is the vertex of the angle formed by the door and the door frame? (1)
- If the door is opened to form a right angle, what is the measure of this angle? (1)
- If the door is opened to form an angle of 120° , what type of angle is this? Justify your answer. (2)

OR

Explain how you would use a protractor to measure the angle formed by the door. (2)

39. An angle that measures exactly 0° is called a: [1]

- Zero angle
- Right angle
- Reflex angle
- Straight angle

40. Get a slanting crease on the paper. Now, try to get another crease that is perpendicular to the slanting crease. [1]

- How many right angles do you have now? Justify why the angles are exact right angles.
- Describe how you folded the paper so that any other person who doesn't know the process can simply follow your description to get the right angle.

41. How many degrees are there in a straight angle? [2]

42. Why do acute and obtuse angles have different uses in real life? [3]

43. **Read the following text carefully and answer the questions that follow:** [4]

Vidya is playing on a swing in the park. She notices that the swing moves back and forth, forming different angles with the vertical support. She wonders how the angle affects the speed of the swing. When the swing is at a larger angle, it moves faster, and when it is at a smaller angle, it moves slower. Vidya learns that the angle of the swing is related to its speed and motion.

- What is the vertex of the angle formed by the swing and the vertical support? (1)
- If the swing forms an angle of 60° with the vertical support, what type of angle is this? (1)
- Explain how the angle formed by the swing affects its speed. (2)

OR

If the swing forms an angle of 150° with the vertical support, what type of angle is this? Justify your answer. (2)

44. **Assertion (A):** An obtuse angle is greater than 90 degrees but less than 180 degrees. [1]

Reason (R): Obtuse angles are always larger than right angles.

- Both A and R are true and R is the correct explanation of A.
- Both A and R are true but R is not the correct explanation of A.
- A is true but R is false.
- A is false but R is true.

45. The number of degrees in a complete angle is: [1]

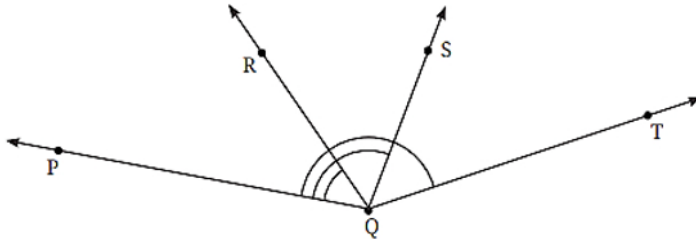
- 360°
- 90°
- 180°
- 270°

46. The angle of a door: [1]

Is it possible to express the amount by which a door is opened using an angle? What will be the vertex of the angle and what will be the arms of the angle?



47. Find the degree measures of $\angle PQR$, $\angle PQS$ and $\angle PQT$. [1]



48. What is meant by measuring an angle? [2]
 49. Why is a protractor used to measure angles? [3]
 50. How would you measure and draw an angle of 60° using a protractor? [5]
 51. **Read the following text carefully and answer the questions that follow:** [4]

The Ashoka Chakra on the Indian flag has 24 spokes. Each spoke is equally spaced, forming equal angles between them. Ravi wants to calculate the angle between two adjacent spokes. Since a circle has 360 degrees, dividing it by 24 spokes gives 15 degrees between each spoke. Ravi calculates that the angle between two adjacent spokes is 15 degrees. This helps him understand the symmetry of the Ashoka Chakra.

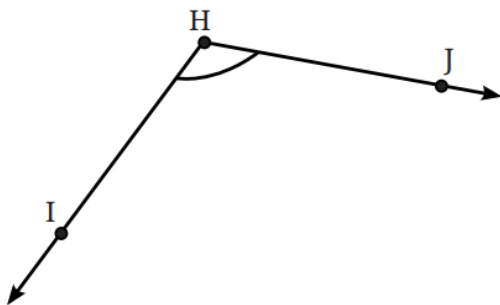
- How many degrees are in a full circle? (1)
- What is the angle between two adjacent spokes of the Ashoka Chakra? (1)
- Calculate the angle between two spokes that are 5 spokes apart. (2)

OR

If the Ashoka Chakra had 12 spokes instead of 24, what would be the angle between two adjacent spokes? (2)

52. Which of the following is the correct sequence to draw an angle using a protractor? [1]
- | | |
|---|--|
| a) Mark angle \rightarrow Place ruler \rightarrow Draw arc | b) None of these |
| c) Draw a base line \rightarrow Place protractor \rightarrow
Mark angle \rightarrow Join | d) Draw arc \rightarrow Draw rays \rightarrow Place center |

53. Draw an angle whose degree measure is the same as the angle given below: [1]



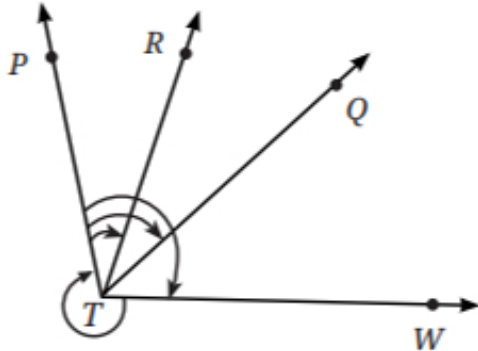
Also, write down the steps you followed to draw the angle.

54. What is the use of a compass in geometry? [2]
 55. Where will the hour hand of a clock stop if it starts [3]
- from 6 and turns through 1 right angle?
 - from 8 and turns through 2 right angles?

- c. from 10 and turns through 3 right angles?
- d. from 7 and turns through 2 straight angles?

56. Which of these angles lies between 0° and 90° ? [1]
- a) Obtuse angle
 - b) Right angle
 - c) Reflex angle
 - d) Acute angle

57. Use a protractor to find the measure of each angle. Then classify each angle as acute, obtuse, right, or reflex. [1]
- a. $\angle PTR$
 - b. $\angle PTQ$
 - c. $\angle PTW$
 - d. $\angle WTP$



58. Why do we use different types of angles in construction and design? [3]
59. What are the different types of angles? Explain with examples. [5]
60. **Fill in the blanks:** [9]

- (a) Lines that never meet at a point are called _____ . [1]
- (b) A _____ has a starting point but no end point. [1]
- (c) A _____ extends endlessly in both directions. [1]
- (d) The unit used to measure angles is called a _____. [1]
- (e) When two lines cross each other, they form _____ angles at the point of intersection. [1]
- (f) An angle greater than 0° but less than 90° is called an _____ angle. [1]
- (g) The size of an angle is measured using an instrument called a _____. [1]
- (h) To draw an angle of a given measure, we use a protractor along with a _____. [1]
- (i) A _____ angle measures exactly 90 degrees. [1]

61. **State whether the given statement is True or False:** [6]
- (a) There are two parallel lines in the given figure? [1]



- (b) A line segment has two endpoints and a fixed length, while a line extends endlessly in both directions. [1]
- (c) Comparing two angles using a protractor always gives an approximate result. [1]
- (d) Two angles can be compared by placing one over the other so that their vertices and one arm coincide. [1]
- (e) A straight angle measures exactly 180° . [1]
- (f) A full circle is divided into 100 equal parts, and each part is called 1 degree. [1]

62. **Fill in the blanks:** [1]

(a) Lines that never meet at a point are called _____ lines.

[1]

Solution

MATHS LINES AND ANGLES PA 1

Class 06 - Maths (NEW)

1. (a) Perpendicular

Explanation:

A line is said to be perpendicular to another line if the two lines intersect at 90° .

- 2.

(b) 3

Explanation:

Letters L, G and I have parallel lines.

3. (a) - (ii), (b) - (i), (c) - (iv), (d) - (iii)

4. (a) - (ii), (b) - (iv), (c) - (i), (d) - (iii).

5. There are 3 figures which have parallel lines i.e. square, hexagon and octagon.

- 6.

(b) BD

Explanation:

BD is not a line segment in a given figure.

- 7.

(b) EF

Explanation:

EF

- 8.

(b) BF

Explanation:

BF is a longest line as it contains 3 points(C, D, E) in it.

9. (a) Line segment CD

Explanation:

Line segment CD

- 10.

(c) (a) - (ii), (b) - (iii), (c) - (i)

Explanation:

A line segment has two end points.

A line has no end points.

A ray has only one end point.

11. (a) No

Explanation:

A line can be extended from both sides. It has no definite length so, a line has no endpoints.

- 12.

(c) One

Explanation:

The rays coming from torch or sun are examples of rays. A ray has only one endpoint.

13. (a) Both A and B is correct

Explanation:

Both statement are correct as a line has no end points as it can be extended from both sides and can go to infinity and it does not have a definite length as its length cannot be measured.

14. (a) Both A and B is correct

Explanation:

Both statements are correct as a line segment has two end point. It starts from one point and ends at another point and it has a definite length. Its length can be measured.

- 15.

(c) Line

Explanation:

Line

- 16.

(b) Two endpoints

Explanation:

Two endpoints

17. (a) - (iv), (b) - (iii), (c) - (ii), (d) - (i)

18. i. Five points:

D, E, O, C, B

ii. A line $\Rightarrow \overleftrightarrow{DB}$

iii. Four rays:

$\overrightarrow{OB}, \overrightarrow{OC}, \overrightarrow{OE}, \overrightarrow{OD}$

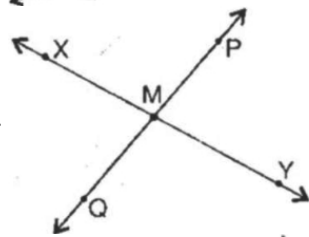
iv. Five line segments:

$\overline{DE}, \overline{EO}, \overline{OC}, \overline{OB}, \overline{EB}$

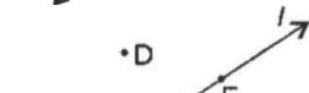
19. a.



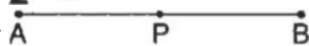
- b.



- c.



- d.



20. i. AD is a line.

ii. Four line segments are: $\overline{OA}, \overline{OB}, \overline{OC}$ and \overline{OD} . Here, the end-point O is common in all four line segments.

iii. Four rays are: $\overrightarrow{OA}, \overrightarrow{OB}, \overrightarrow{OC}$ and \overrightarrow{OD} . Here O is the same starting point.

iv. O, A, B, C, and D are five points.

21.
 - Parallel lines never meet and remain the same distance apart (e.g., railway tracks, notebook lines).
 - Perpendicular lines meet at a 90° angle (e.g., walls meeting the floor, the edges of a book). Both types of lines are essential in geometry, construction, and design.

22. a. The vertex of the angle is the point where the two arms of the compass meet.

- b. The measure of a right angle is 90° .
 c. The size of the angle formed by the compass arms determines the radius of the circle. A larger angle will result in a larger circle, while a smaller angle will result in a smaller circle.

OR

An angle of 45° is an acute angle because it is less than 90° .

23. (a) Both A and R are true and R is the correct explanation of A.

Explanation:

Both A and R are true and R is the correct explanation of A.

24.

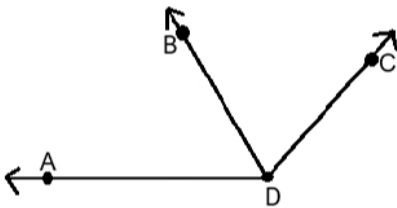
(b) Rays

Explanation:

Rays

25. (a) - (iii), (b) - (iv), (c) - (i), (d) - (ii)

26.



All the angles in the figure are-

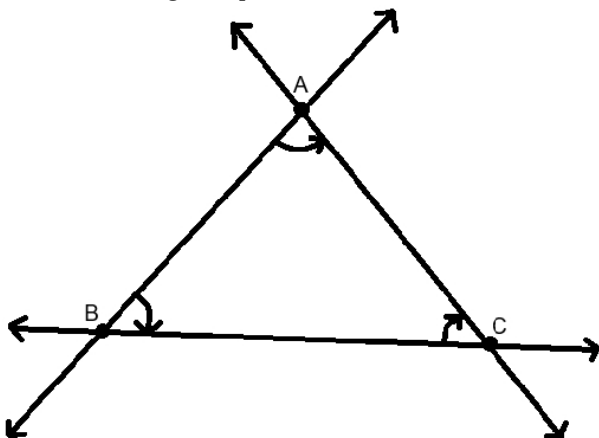
$\angle ADB, \angle ADC, \angle BDC$

Rays in the figure are-

$\overrightarrow{DA}, \overrightarrow{DB}, \overrightarrow{DC}$

Vertex of the angles is point D.

27.



We get three lines $\Rightarrow \overleftrightarrow{AB}, \overleftrightarrow{AC}, \overleftrightarrow{BC}$

All the possible angles are $\Rightarrow \angle ABC, \angle BCA, \angle BAC$

28. The vertex of an angle is the common point at which the two arms or rays of the angle meet. It is the corner point from where the angle opens. For example, if angle ABC is formed by rays BA and BC, point B is the vertex. The vertex plays a key role in naming and identifying the angle.
29. The arms of an angle are the two rays that form the angle by meeting at a common endpoint called the vertex. These arms represent the directions in which the angle opens. In angle ABC, the rays BA and BC are the arms. The length of the arms is not fixed; what matters is the amount of rotation between them.
30. Naming angles properly avoids confusion in geometry. An angle is named using three points:

- The **vertex** (middle letter)
- A **point on each arm**

For example, in $\angle ABC$, B is the vertex, and AB and BC are the arms. If angles are not named properly, we might refer to different angles mistakenly. In a shape with multiple angles, such as a pentagon, using proper names helps differentiate between different angles and makes communication clearer in geometry.

31.

(b) Both A and R are true but R is not the correct explanation of A.

Explanation:

Both A and R are true but R is not the correct explanation of A.

32.

(b) One angle is larger

Explanation:

One angle is larger

33. In the given figure:

$$\angle XO A > \angle BO Y$$

$$\Rightarrow \angle XO A + \angle AO Y > \angle BO Y + \angle AO Y$$

$$\Rightarrow \angle XO Y > \angle AO B$$

34. Comparing angles means identifying which angle is larger or smaller. This can be done visually, by tracing and overlapping, or by measuring them using a protractor. Another way is folding paper to match angle sizes. Comparing angles helps in understanding geometry better, especially when classifying triangles or constructing geometric figures with specific angle measures.

35. a. $\angle AOB > \angle XOY$, because $\angle XOY$ is contained in $\angle AOB$. It means $\angle XOY$ is a part of $\angle AOB$.

b. $\angle AOB > \angle XOB$, because $\angle XOB$ is contained in $\angle AOB$. It means $\angle XOB$ is a part of $\angle AOB$.

c. $\angle XOB = \angle XOC$, because both the angles are formed with the same rays.

36. i. **Superimposition:** Place one angle over another to compare their sizes.

ii. **Paper Folding:** Fold paper to create angles and compare them visually.

iii. **Using Everyday Objects:** Compare angles using a book's corner (90°) as a reference.

37. Comparing angles helps in construction, design, and problem-solving in mathematics.

Ways to compare angles without a protractor:

i. **Superimposition:** Place one angle over another to see which is larger.

ii. **Paper Folding:** Fold a paper at different angles and compare.

iii. **Using a Clock:** A clock's hands form angles that can be compared visually (e.g., 3 o'clock forms a right angle).

Understanding and comparing angles help in fields like engineering and architecture.

38. a. The vertex of the angle is the hinge of the door.

b. The measure of a right angle is 90° .

c. An angle of 120° is an obtuse angle because it is greater than 90° but less than 180° .

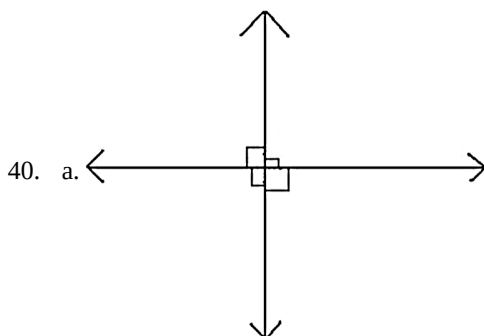
OR

To measure the angle formed by the door, place the protractor's center at the hinge, align one arm of the angle with the 0° mark, and read the measure where the other arm crosses the protractor.

39. (a) Zero angle

Explanation:

Zero angle



→ We get 4 right angles.

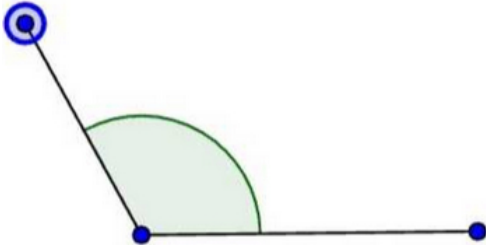
→ Because, if we make perpendicular crease on the paper, it divides in 4 equal angles. That is each angle is right angle.

b. First, we fold the paper perpendicularly. So that the paper is symmetrical about the crease and make another crease which is perpendicular to the first crease.

41. A straight angle measures exactly 180 degrees. It looks like a straight line and represents half of a complete circle. A straight angle shows a reversal in direction and is useful in drawing opposite lines. It divides a full rotation (360°) into two equal parts and is important for understanding linear and opposite movements in geometry.

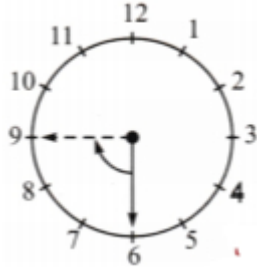
42.
 - **Acute angles** ($< 90^\circ$): Used in roof slopes, bridges, and arrowheads for efficiency.
 - **Obtuse angles** ($> 90^\circ$): Found in chair backrests, road turns, and recliners for comfort. The choice of angles affects stability, design, and usability in daily objects and structures.
43.
 - a. The vertex of the angle is the point where the swing is attached to the support.
 - b. An angle of 60° is an acute angle.
 - c. The larger the angle formed by the swing, the greater the speed of the swing because a larger angle means more potential energy is converted into kinetic energy.
- OR**
- An angle of 150° is an obtuse angle because it is greater than 90° but less than 180° .
44. **(a)** Both A and R are true and R is the correct explanation of A.
Explanation:
Both A and R are true and R is the correct explanation of A.
45. **(a)** 360°
Explanation:
 360°
46.
 - Yes, we can express the open door by using an angle.
 - Vertex of the angle is joint of door with the wall.
 - Arms of the angle are - door and the wall.
47. $\angle PQR = 48^\circ$
 $\angle PQS = 95^\circ$
 $\angle PQT = 145^\circ$
48. Measuring an angle means finding its size in degrees using a tool like a protractor. The angle is placed so that the center of the protractor is on the vertex and one arm lies along the baseline. The number where the second arm points gives the measure of the angle. Measuring angles helps in understanding their size and comparing them.
49. A protractor is a tool used to measure and draw angles accurately. It has markings from 0° to 180° , helping to classify angles as acute ($< 90^\circ$), right (90°), obtuse ($> 90^\circ$), straight (180°), or reflex ($> 180^\circ$). Without a protractor, measuring angles precisely would be difficult, leading to errors in construction and design.
50. To draw a 60° angle using a protractor:
- i. **Draw a line segment** and mark a point (O) on it.
 - ii. **Place the protractor** on point O with the base aligned to the line.
 - iii. **Find the 60° mark** on the protractor and mark it.
 - iv. **Draw a line** from O through the marked point.
 - v. Label the angle as $\angle AOB = 60^\circ$.
51.
 - a. A full circle has 360° .
 - b. The angle between two adjacent spokes is 15° ($360^\circ \div 24$).
 - c. The angle between two spokes that are 5 spokes apart is 75° ($15^\circ \times 5$).
- OR**
- If there were 12 spokes, the angle between two adjacent spokes would be 30° ($360^\circ \div 12$).
52. **(c)** Draw a base line \rightarrow Place protractor \rightarrow Mark angle \rightarrow Join
Explanation:
Draw a base line \rightarrow Place protractor \rightarrow Mark angle \rightarrow Join
53. The given angle IHJ is 118° .
Step I: Draw a ray AB.
Step I: Measure the angle IHJ. It is 118°
Step III: Place the centre of the protractor at A and along AB.
Step IV: Mark a point C at 118° .

Step V: Join AC, Thus, $\angle BAC = \angle IHJ$.

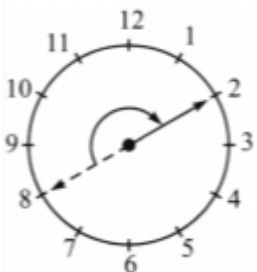


54. A compass is a tool used in geometry to draw circles and arcs. It has two arms—one with a pointed end and the other with a pencil. It helps in constructing angles, transferring distances, and making symmetrical shapes. In angle construction, a compass can be used along with a ruler and protractor to make precise diagrams.

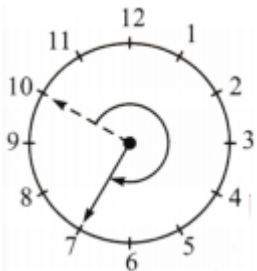
55. a. Starting from 6 and turning through 1 right angle, the hour hand will reach at 9.



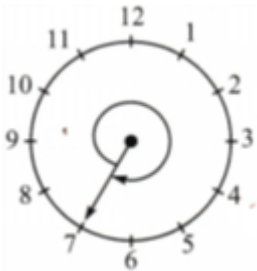
b. Starting from 8 and turning through 2 right angles, the hour hand will reach at 2.



c. Starting from 10 and turning through 3 right angles, the hour hand will reach at 7.



d. Starting from 7 and turning through 2 straight angles, the hour hand will reach at 7.



56.

(d) Acute angle

Explanation:

Acute angle

57. i. $\angle PTR = 30^\circ$
 ii. $\angle PTQ = 60^\circ$
 iii. $\angle PTW = 85^\circ$
 iv. $\angle WTP = 105^\circ$

58. Different angles help in designing strong and functional structures.

- Right angles (90°) are used in buildings and furniture to provide stability.
- Acute angles ($< 90^\circ$) are used in roof designs and bridges.
- Obtuse angles ($> 90^\circ$) appear in sloped ramps and modern architecture.

Angles help engineers and architects ensure balance and strength in their designs.

59. There are five main types of angles:

- Acute Angle ($0^\circ-90^\circ$):** Less than 90° . Example: A slice of pizza.
- Right Angle (90°):** Exactly 90° . Example: A corner of a book.
- Obtuse Angle ($90^\circ-180^\circ$):** Greater than 90° but less than 180° . Example: An open door.
- Straight Angle (180°):** Forms a straight line. Example: The hands of a clock at 6:00.
- Reflex Angle ($180^\circ-360^\circ$):** Greater than 180° . Example: A clock's hands at 10:10.

60. Fill in the blanks:

- Lines that never meet at a point are called Parallel lines.
- ray
- line
- degree
- four
- acute
- protractor
- ruler
- right

61. State whether the given statement is True or False:

- (a) True**
Explanation: { True
- (a) True**
Explanation: { True, A line segment connects two fixed points and has a measurable length. A line, however, extends indefinitely in both directions without endpoints.
- (b) False**
Explanation: { False, Using a protractor gives an exact degree measure, allowing for accurate comparison.
- (a) True**
Explanation: { This method is called superimposition and is used to visually compare the sizes of two angles.
- (a) True**
Explanation: { A straight angle forms a straight line and its measure is 180° , which is half of a full turn.
- (b) False**
Explanation: { False, A full circle is divided into 360 degrees, not 100. Each unit of measure is called 1° (one degree).

62. Fill in the blanks:

1. Parallel