Class- 7   **Subject- MATHEMATICS**

CHAPTER – 5

**LINES AND ANGLES (HAND OUT)**   Module-$\dfrac{1}{3}$

INTRODUCTION:

Point- It has no length, breadth and height, it has only the position.

 A point can be drawn by using the sharp end of a pencil. It is named by using a capital letter.

   Such that. A It is called point A.

Line segment- Line segment is made of infinite numbers of points. It has two end points. It has a definite length, so we can measure it.
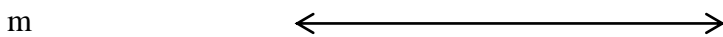
        A ‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾ B
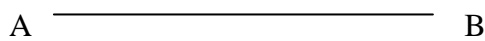
 It is named as $\overline{AB}$.

Line - If two end points of a line segment are extended up to infinity in both the directions, then it is called a line. It has no end points. Line does not have a definite length, so cannot be measured.

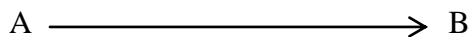It cannot be drawn, but we can represent it by the following way.

        P ⟵――――――――⟶ Q

It is named as $\overleftrightarrow{PQ}$.

m

        ⟵――――――――⟶
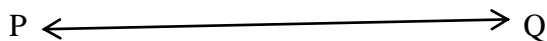
   Line is also named by using a small letter. line m.

Ray- If one end point of a line segment is extended up to infinity only in one direction then it is called a ray.
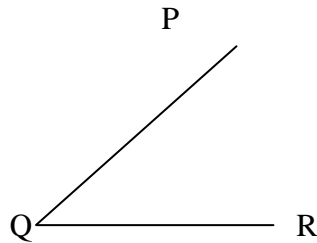
        A ―――――――⟶ B

 It is named as $\overrightarrow{AB}$

        A ⟵――――――― B

 It is named as $\overrightarrow{BA}$

Angle –When two rays, two line segments or two lines meet together at a point, then the inclination made by them is called an angle.

 It has two arms and a vertex. The point of intersections of two line segment or rays or lines is called vertex.

Tis named as ∟PQR or ∟RQP, vertex should always be at the middle of three letters.

On the basis of the measure of the angles we can divide it into the following category-

Acute angle – The angle whose measure is greater than 0^0 and less than 90^0 is called an acute angle.

Example – $1^0,20^0,60^0,75^0,89^0,89.99^0$ ---------------------------------

Obtuse angle- The angle whose measure is greater than 90^0 and less than 180^0 is called an obtuse angle

- Example- $90.5^0,91^0,100^0,110^0,120^0,150^0,170^0,179.9^0$ -----------------------

Right angle – The angle whose measure is 90^0 is called a right angle.

Straight angle – The angle whose measure is 180^0 is called a straight angle.

Complete angle – The angle whose measure is 360^0 is called a complete angle.

Reflex angle – The angle whose measure is greater than 180^0 and less than 360^0 is called a reflex angle.

Example- $181^0,190^0,198^0,200^0,270^0,300^0.320^0$ etc.

RELATED TO ANGLES –

 COMPLEMENTARY ANGLES –

 If the sum of two angles is 90^0,then they are said to be complementary angles, and one angle is complement to each other.

 Example- 60^0 and 30^0 are complementary angles.

$60^0 + 30^0 = 90^0$. 60^0 is complement of 30^0 and 30^0 is complement of 60^0.

Q1.Are 50^0 and 45^0 complementary angles?

 $50^0 + 45^0 = 95^0$

 No, they are not complementary angles as their sum is more than 90^0.

Q2.Are 30^0 and 55^0 complementary angles?

 $30^0 + 55^0 = 85^0$

No, they are not complementary angles as their sum is less than 90^0.

Q3.Can two acute angles be complement to each other?

Yes, as the measure of acute angle is less than 90^0, so the sum of some acute angles may be 90^0.

Example. 60^0 and 30^0 are complementary angles. $60^0 + 30^0 = 90^0$. Like this many pairs are there whose sum is 90^0.

Q4. Can two obtuse angles be complement to each other?

No, as the measure of obtuse angle is more than 90^0 and less than 180^0, so the sum of two obtuse angles is always more than 90^0.

Q5. What is the measure of the complement of 55^0?

Let the complement of $55^0 = x$

So, $x + 55^0 = 90^0$

$X = 90^0 - 55^0 = 35^0$

Q6. Find the angle which is equal to its complement?

Let one of the equal angles $= x$

$x + x = 90^0$

$2x = 90^0$

$x = \frac{90^0}{2} = 45^0$

SUPPLEMENTARY ANGLES –

If the sum of two angles is 180^0, then they are said to be supplementary angles, and one angle is supplement to each other.

Example- 70^0 and 110^0 are supplementary angles.

$70^0 + 110^0 = 180^0$. 70^0 is supplement of 110^0 and 110^0 is supplement of 60^0.

Q1. Are 150^0 and 45^0 supplementary angles?

$150^0 + 45^0 = 195^0$

No, they are not supplementary angles as their sum is more than 180^0.

Q2. Are 30^0 and 145^0 supplementary angles?

$30^0 + 145^0 = 175^0$

No, they are not supplementary angles as their sum is less than 180^0.

Q3. Can two acute angles be supplement to each other?

No, as the measure of acute angle is less than 90^0, so the sum of two acute angles is always less than 180^0.

Q4.Can two obtuse angles be supplement to each other?

No, as the measure of obtuse angle is more than 90^0 and less than 180^0, so the sum of two obtuse angles is always more than 180^0.

Q5.What is the measure of the supplement of 85^0?

Let the supplement of 85^0 = x

So, x + 85^0 = 180^0

X = 180^0 – 85^0= 95^0.

Q6.Find the angle which is equal to its supplement?

Let one of the equal angles = x

x + x = 180^0

2x = 180^0

x = $\frac{180^0}{2}$ = 90^0.

What we have learnt?

a.Point: It has only the position.

b.Linesgment: It has two end points and has a definite length.

c.Line: It does nothave any end points and it can be extended up to infinity in both the directions.

d. Ray:It has one end point and it can be extended up to infinity in one direction only.

e. Angle: When two line segments or rays meet together, then the inclination made by them is called an angle.

f. Complementary angles: Two angles whose sum is 90^0 are called complementary angles.

g.Supplementary angles: Two angles whose sum is 180^0 are called complementary angles.

ASSIGNMENTS -

1.Fill in the blanks:-

(a) The sum of two complementary angles is ------- .

(b) The sum of two supplementary angles is ------- .

(c) The angle which is equal to its complement is ------ .

(d) The angle which is equal to half of its supplement is -------.

(e) The angle whose measure is 90^0 is called --------- angle.

2. Check whether the following pair of angles are complementary angles:

   (a) 47^0 and 43^0

   (b) 65^0 and 35^0

   (c) 56^0 and 24^0

   (e) 70.5^0 and 19.5^0

3. Check whether the following pair of angles are supplementary angles:

   (a) 145^0 and 43^0

   (b) 105^0 and 75^0

   (c) 67^0 and 74^0

   (e) 170.5^0 and 9.5^0

4. Find the angle which is double of its complement?

5. Find the angle which is two-third of its complement.

6. Find the angle which is double of its supplement?

7.Find the angle which is one-third of its supplement?

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