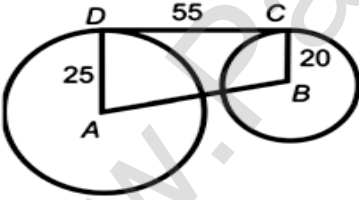

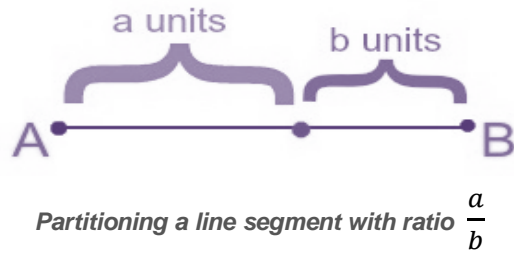


**CLASS 10-Math Sample Paper ( 2021-22 )****Term 2****Marks : 40****Time : 120 minutes****General Instructions:**

1. The question paper consists of 14 questions divided into 3 sections A, B, C.
2. All questions are compulsory.
3. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
4. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
5. Section C comprises of 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case study based questions.

<b>Section-A</b>		<b>Mks</b>
1.	(i) Which term of the AP : 21, 18, 15, ... is - 81?  ( OR )  (ii) If p, q, r are in an A.P and $p - q = r$ , then find the value of p in terms of q.	2
2.	Two men on either side of a 75 m high building and in line with base of building observe the angles of elevation of the top of the building as $30^\circ$ and $60^\circ$ . Find the distance between the two men.	2
3.	Find the distance between the centres A and B of the two circles.  	2
4.	(i) Find the value of the discriminant for $3\sqrt{2}x^2 + 5x - \sqrt{2}$  ( OR )  (ii) Find the values of k for which the roots of the equation $2x^2 - 2kx + 18 = 0$ are real and distinct.	2
5.	If two tangents are inclined at $60^\circ$ are drawn to a circle of radius 3 cm then find length of each tangent.	2
6.	Find the roots of the equation $4x^2 - 7\sqrt{2}x + 6 = 0$ by splitting the middle term.	2

<b>Section-B</b>		Mks
7.	<p>Draw a circle of radius 6 cm. From a point 10 cm away from its centre, construct the pair of tangents to the circle and measure their lengths.</p> <p style="text-align: center;">( OR )</p> <p>Draw a line segment <math>AB</math> of length 8 cm. Taking <math>A</math> as centre, draw a circle of radius 4 cm and taking <math>B</math> as centre, draw another circle of radius 3 cm. Construct tangents to each circle from the centre of the other circle.</p>	3
8.	The eighth term of an AP is half its second term and the eleventh term exceeds one third of its fourth term by 1. Find the 17th term.	3
9.	On a straight line passing through the foot of a tower, two $C$ and $D$ are at distance of 4 m and 16 m from the foot respectively. If the angles of elevation from $C$ and $D$ of the top of the tower are complementary, then find the height of the tower.	3
10.	Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.	3
<b>Section-C</b>		Mks
11.	<p>Amit, standing on a horizontal plane, find a bird flying at a distance of 200 m from him at an elevation of <math>30^\circ</math>. Deepak standing on the roof of a 50 m high building, find the angle of elevation of the same bird to be <math>45^\circ</math>. Amit and Deepak are on opposite sides of the bird. Find the distance of the bird from Deepak.</p> <p style="text-align: center;">( OR )</p> <p>From the top of a hill, the angle of depression of two consecutive kilometre stones due east are found to be <math>45^\circ</math> and <math>30^\circ</math> respectively. Find the height of the hill. [Use <math>\sqrt{3} = 1.73</math>]</p>	4
12.	If $a\left(\frac{1}{b} + \frac{1}{c}\right), b\left(\frac{1}{c} + \frac{1}{a}\right), c\left(\frac{1}{a} + \frac{1}{b}\right)$ are in AP. Prove that $a, b, c$ are in AP.	4
13.	<p>At the circus, Mayank, the magnificent is walking on the tight rope. It takes him 10 equal size steps to get across the rope. He takes seven steps flawlessly, then wobbles a bit, and quickly takes the last three steps to land safely on the end platform.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">The point where Mike wobbles partitions the rope (line segment) into the ratio <math>\frac{7}{3}</math>.</p>	4

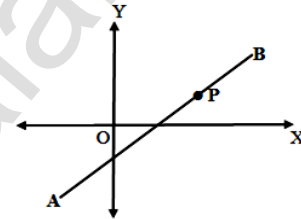


It just so happens that Mayank just performed a mathematical feat called partitioning a line segment. Partitioning a directed line segment,  $AB$ , into a ratio  $\frac{a}{b}$  involves dividing the line segment into  $a + b$  **equal parts** and finding a point, that is, **a equal parts** from  $A$  and **b equal parts** from  $B$ .

**Based on the above given concept, answer the following questions.**

A cargo boat leaves Port  $A(-30, -40)$  heading for Port  $B(90, 60)$  but has engine trouble when it reaches  $P$  at  $\frac{5}{8}$  of the distance from  $A$  to  $B$ . What is the ratio of  $AP$  to  $PB$ ?

- (i)  $5 : 8$       (ii)  $5 : 3$       (iii)  $3 : 8$       (iv)  $8 : 5$



If the line segment is extended in two directions indefinitely from each of the two points then it is classified as \_\_\_\_\_.

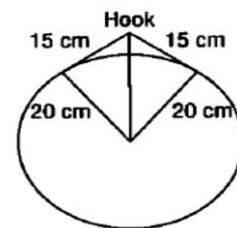
- (i) intersecting line      (ii) plane      (iii) line      (iv) ray

14.

**Recap the concepts involved in Circles and Tangents, answer the following questions.**

A circular mirror with radius  $20$  cm hangs by a wire from a hook. The wire is  $30$  cm long and is a tangent to the mirror in two places. How far above the top of the mirror is the hook?

- (i)  $25$  cm    (ii)  $5$  cm    (iii)  $30$  cm    (iv)  $10$  cm



How many tangents a circle can have?

- (i) only one    (ii) no tangents    (iii) infinitely many    (iv) two tangents

4