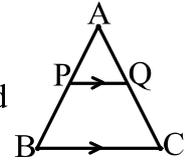


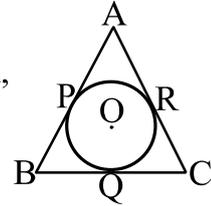


- (g) In the adjoining figure,  $PQ \parallel BC$  if  $PB = 6$  cm,  $AP = 4$  cm and  $AQ = 8$  cm. The length of  $AC$  is equal to  
 (i) 6 cm (ii) 12 cm  
 (iii) 14 cm (iv) 20 cm



1

- (h) In the adjoining figure, a circle touches the sides  $AB$ ,  $BC$  and  $AC$  of  $\triangle ABC$  at  $P$ ,  $Q$  and  $R$  respectively. If  $AP = 4$  cm,  $BP = 6$  cm,  $AC = 12$  cm, then  $BC$  is equal to  
 (i) 12 cm (ii) 14 cm  
 (iii) 15 cm (iv) 16 cm



1

- (i) If tangents  $PA$  and  $PB$  from a point  $P$  to a circle with centre  $O$  are inclined to each other at angle of  $60^\circ$ , then  $\angle POA$  is equal to  
 (i)  $120^\circ$  (ii)  $80^\circ$  (iii)  $70^\circ$  (iv)  $60^\circ$

1

- (j) Area of a sector of angle  $P$  (in degrees) of a circle with radius  $R$  is  
 (i)  $\frac{P}{1^\circ} \times 2\pi$  (ii)  $\frac{P}{1^\circ} \times \pi R^2$  (iii)  $\frac{P}{3^\circ} \times 2\pi$  (iv)  $\frac{P}{7^\circ} \times 2\pi R^2$

1

- (k) The perimeter of quadrant of a circle whose radius is  $\frac{7}{2}$  cm is  
 (i) 3.5 cm (ii) 5.5 cm (iii) 7.5 cm (iv) 12.5 cm

1

- (l) If the ends of a cylinder are covered by two hemispherical shaped lid of equal shape, then the total curved surface area of the new object will be  
 (i)  $4\pi rh + 2\pi r^2$  (ii)  $4\pi rh - 2\pi r^2$  (iii)  $2\pi rh + 4\pi r^2$  (iv)  $2\pi rh + 4\pi r$

1

- (m) The total surface area of a hemispherical solid having radius 7 cm is  
 (i)  $154 \text{ cm}^2$  (ii)  $294 \text{ cm}^2$  (iii)  $462 \text{ cm}^2$  (iv)  $588 \text{ cm}^2$

1

- (n) In a competitive examination, 85 boys and 35 girls appeared. The mean marks of boys was found to be 40%, whereas the mean marks of girls was 60%. The average marks percentage of these students is  
 (i) 45.00 (ii) 45.83 (iii) 54.00 (iv) 54.38

1

- (o) If  $P(E)$  denotes the probability of an event  $E$ , then  
 (i)  $P(E) < 0$  (ii)  $P(E) > 1$  (iii)  $0 \leq P(E) \leq 1$  (iv)  $-1 \leq P(E) \leq 1$

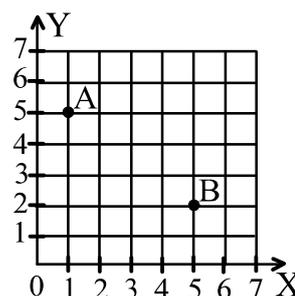
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**Section – B**

2. Find the HCF of 96 and 404 by prime factorisation method and find their LCM. 2
3. For what value of  $k$  does the quadratic equation  $kx(x - 2) + 6 = 0$ ;  $k \neq 0$  have two equal roots? 2

4. If in a right triangle,  $\sec \theta = \frac{1}{1}$ , calculate  $\cot \theta$  and  $\operatorname{cosec} \theta$ . 2

5. In the given figure, find the distance between A and B. 2



6. E and F are points on the sides PQ and PR respectively of a  $\Delta PQR$ .  $PQ = 1.28$  cm,  $PR = 2.56$  cm,  $PE = 0.18$  cm and  $PF = 0.36$  cm. Check, whether  $EF \parallel QR$  or not. 2

7. To build a wind turbine for generating energy in a Science project, Kavili of Class X is asked to cut six sectors of equal areas from a circular metal sheet of diameter 14 cm. She then removes alternate three sectors such that, the remaining three sectors form a wind turbine (as shown in the figure). Find the area of metal sheet removed. 2



8. A lot consists of 144 ball pens of which 20 are defective and the others are good. Nuri will buy a pen if it is good, but will not buy if it is defective. The shopkeeper draws one pen at random and gives it to her. What is the probability that (i) she will buy it? (ii) she will not buy it? 2

### Section – C

9. Find the zeroes of the quadratic polynomial  $6x^2 - 3 - 7x$  and verify the relationship between the zeroes and the coefficients. 3

10.(a) Solve the pair of linear equations by elimination method:  $3x - 5y - 4 = 0$  and  $9x = 2y + 7$  3

**Or**

(b) Solve the equation  $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$  by using quadratic formula. 3

11. (a) The sum of the 4<sup>th</sup> and 8<sup>th</sup> terms of an A.P. is 24 and the sum of the 6<sup>th</sup> and 10<sup>th</sup> terms is 44. Find the first three terms of the A.P. 3

**Or**

(b) The first term and last term of an A.P. are 17 and 350 respectively. If the common difference is 9, how many terms are there and what is their sum? 3

12. If  $\sin(A - B) = \frac{1}{2}$ ,  $\cos(A + B) = \frac{1}{2}$ ,  $0^\circ < A + B \leq 90^\circ$ ,  $A > B$ , find A and B. 3

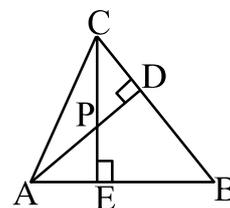
13. Prove that :  $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$ , where angle A is acute. 3

14. a. Two poles of equal heights are standing opposite each other on either side of the road, which is 80 m wide. From a point between them on the road, the angles of elevation of the top of the poles are  $60^\circ$  and  $30^\circ$  respectively. Find the height of the poles and the distances of the point from the poles.

**Or**

- b. The shadow of a tower standing on a level ground is found to be 40m longer when the sun's altitude is  $30^\circ$  than when it is  $60^\circ$ . Find the height of the tower.
15. Find the area of a rhombus if its vertices are (3, 0), (4, 5), (-1, 4) and (-2, -1) taken in order.

16. In the adjoining figure, altitudes AD and CE of  $\triangle ABC$  intersect each other at the point P. Show that:  
(i)  $\triangle AEP \sim \triangle CDP$  (ii)  $\triangle ABD \sim \triangle CBE$



17. a. Prove that the lengths of tangents drawn from an external point to a circle are equal.

**Or**

- b. Prove that the parallelogram circumscribing a circle is a rhombus.
18. In a circle of radius 21 cm, an arc subtends an angle of  $60^\circ$  at the centre. Find:  
(i) the length of the arc, (ii) area of the sector formed by the arc.

19. a. A tent is in the shape of a cylinder surmounted by a conical top. The height and diameter of the cylindrical part are 2.1 m and 4 m respectively, and the slant height of the top is 2.8 m. Find the area of the canvas used for making the tent and the cost of the canvas of the tent at the rate of ₹500 per  $m^2$ .

**Or**

- b. A solid iron pole consists of a cylinder of height 220 cm and base diameter 24 cm, which is surmounted by another cylinder of height 60 cm and radius 8 cm. Find the mass of the pole, given that  $1\text{ cm}^3$  of iron has approximately 8 g mass (Use  $\pi = 3.14$ )
20. The distance traveled before a tyre needs to be replaced was recorded by the tyre manufacturer. The outcomes of 1000 instances are displayed in the table below.

Distance (in km)	Less than 4000	4000 to 9000	9001 to 14000	More than 14000
No. of tyres	20	210	325	445

What is the probability that, if a tyre is purchased from this company:

- (i) it has to be replaced before 4000 km is covered?  
(ii) it will last more than 9000 km?

3

3

3

3

3

3

3

## Section – D

21. Answer any one from the following questions (a) to (c): 5

- a. Draw the graphs of the equations  $x - y + 1 = 0$  and  $3x + 2y - 12 = 0$ . Determine the coordinate of the vertices of the triangle formed by these lines and the  $x$ -axis and shade the triangular region.

Or

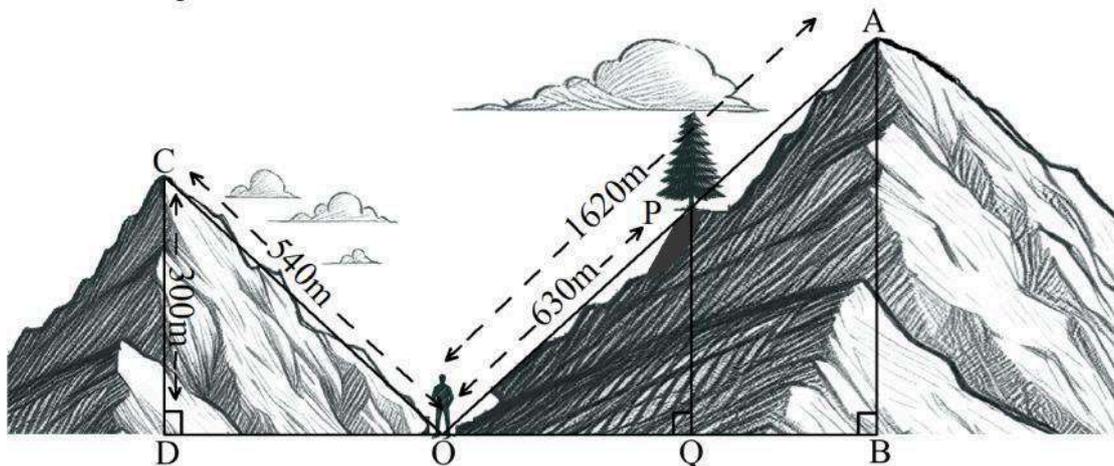
- b. A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid ₹27 for a book kept for seven days, while Susy paid ₹21 for a book she kept for five days. Find the fixed charge and the daily charge for each extra day.

Or

- c. Is it possible to construct a  $400 \text{ m}^2$  rectangular park with an  $80 \text{ m}$  perimeter? Using discriminant, determine whether or not the above situation is possible. If at all possible, use the quadratic formula to determine its length and breadth.

22. Answer any one from the following questions (a) to (c): 5

- a. Akaho is standing at point O, which is positioned between two parallel mountains that differ in height. The line joining their tops to the point O are equally inclined to the level ground. The smaller mountain is 300 meters high. At point P, a pine tree stands on the slope of the bigger mountain. Akaho observes that the foot of the tree just touches the line of sight to the top of the bigger mountain. Using *similarity of triangles*, answer the following:

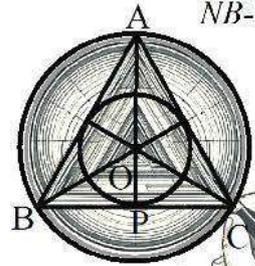


- (i) What is the height of the bigger mountain?  
 (ii) What is the difference in height between PQ and CD?

Or

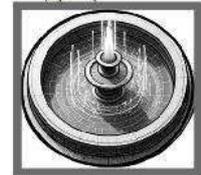
- b. Lanu draws a logo design of a circle of radius  $2 \text{ cm}$ , whose center O inscribed in  $\triangle ABC$ , is circumscribed by another circle with the same center.

Determine the radius OB, if the ratio of the radius OP to the radius OB is 1:2. Show that ABC is equilateral as well.



Or

- c. Landscape designer, Pangmong creates a circular fountain circumscribed by a quadrilateral shaped walkway. Show that the opposite sides of the walkway subtend supplementary angles at the fountain's center.



23. Answer any one from the following questions (a) to (c):

5

- a. The median of the following data is 525. Find the values of  $x$  and  $y$ , if the total frequency is 100.

<b>Class intervals</b>	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
<b>Frequency</b>	2	5	$x$	12	17	20	$y$	9	7	4

Or

- b. In a retail market, fruit vendors were selling mangoes kept in packing boxes. These boxes contained varying number of mangoes. The following was the distribution of mangoes according to the number of boxes.

<b>No. of mangoes</b>	50-52	53-55	56-58	59-61	62-64
<b>No. of boxes</b>	15	110	135	115	25

Find the mean number of mangoes kept in a packing box using Assumed Mean method.

Or

- c. The lengths of 40 leaves of a plant are measured correct to the nearest millimeter, and the data obtained is represented in the following table:

<b>Length (in mm)</b>	118-126	127-135	136-144	145-153	154-162	163-171	172-180
<b>No. of leaves</b>	3	5	9	12	5	4	2

Find the median length of the leaves.

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