

10. In the fig $PQ = QR$, $\angle RQP = 72^\circ$, PC and QC are tangents to the circle $C(O, r)$. Find (i) $\angle POQ$ and ii) $\angle PCQ$.

SECTION - B:

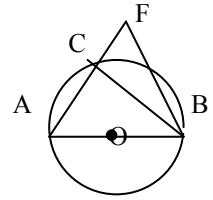
11. For each of the following pair of equations, draw the graph—lines and calculate the area bounded by the graph—lines and the x-axis.

$$4x - 3y + 4 = 0$$

$$4x + 3y - 20 = 0$$

12. The coordinates of A and B are $(-3, a)$ and $(1, a + 4)$ respectively. The mid point of AB is $(-1, 1)$, Find the value of 'a'.

13. If F is in the exterior of a circle with a diameter AB, prove that $\angle AFB$ is an acute angle.



14. Prove the following identities:
- $$\left(1 + \frac{1}{\tan^2\theta}\right) \left(1 + \frac{1}{\cot^2\theta}\right) = \frac{1}{\sin^2\theta (1 - \sin^2\theta)}$$

15. Construct a $\triangle ABC$ in which $AB = 5$ cm. $\angle B = 60^\circ$ and altitude $CD = 3$ cm. Construct a $\triangle AQR$ similar to $\triangle ABC$ such that each side of $\triangle AQR$ is 1.5 times that of the corresponding side of $\triangle ABC$.

16. $A(-8, 4)$, $B(-2, -2)$, $C(2, 2)$ and D form a rectangle. Find the coordinates of D and the length of the diagonals.

17. Derive the quadratic formula.

18. Determine the value of α for which the following system of linear equations has infinitely many solutions.

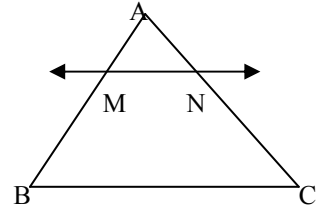
$$\begin{cases} \alpha x + 3y = \alpha - 3 \\ 12x + \alpha y = \alpha \end{cases}$$

19. If α, β are the roots of the equation $3x^2 - 4x - 4 = 0$, from the equation whose roots are $\alpha + 2$ and $\beta + 2$

20. A sewing machine costing Rs 5600, is purchased by Anita on paying Rs 200 initially and the remaining by 3 equal monthly instalments at 12% p.a. Calculate each monthly instalment.

SECTION C:

21. a) Prove in a triangle, a line drawn parallel to one side, to intersect the other sides in distinct points, divides the two sides in the same ratio. .
 b) In fig. $MN \parallel BC$. If $AM = 2x$ cm, $MB = 24$ cm, $AN = 3$ cm and $NC = 18$ cm, find the value of x .



22. a) Prove the ratio of the areas of similar triangles is equal to the ratio of the squares of their corresponding sides.
 b) ABCD is a trapezium with $AB \parallel DC$. If $\Delta AED \sim \Delta BEC$, prove that $AD = BC$.

23. Mrs Renu Chaudhary is an Income. Tax Officer. her annual income from salaries is Rs 192,306. She contributes Rs 14,390 to her Provident Fund account, pays Rs 16,821 as Insurance premium and purchases national Savings Certificates worth of Rs 13,000. She paid Rs 14,000 as advance tax. What refund will she get from Income Tax department?

- a) Standard deduction: Every salaried tax payer is entitled to a consolidated standard deduction of 1/3 rd of his / her gross income subject to a maximum of Rs 30,000 if the salary is upto Rs 1,50,000, Rs 25,000 if the salary exceeds Rs 1,50,000 and is upto Rs 3,00,000. For the salary exceeding Rs 3,00,000 and upto Rs 5,00,000, it is Rs 20,000.

- b) **Rate of Income tax Slab**
 i) Upto Rs. 50,000
 ii) From Rs50,001 to Rs. 60,000
 iii) Rs. 60,001 to 1,50,000
 iv) Above Rs. 1,50,000

- Income Tax**
 No Tax
 10% of the amount exceeding Rs. 50,000
 Rs. 1,000 + 20% of the amount exceeding Rs. 60,000.
 Rs. 19,000 + 30% of the amount exceeding Rs.

- c) **Rebate in income tax**
 maximum of

- i) 20% of the amount of savings subject to a
 Rs 14,000 if taxable income is upto Rs 1, 50,000.

maximum of

- ii) 15% of the amount of savings subject to a
 Rs 10,500 if taxable income is above Rs 1, 50,000

- d) **Surcharge**

5% of the net income tax paid

24. A vertical tower stands on a horizontal plane and is surmounted by a vertical flagstaff of height h . At a point on the plane, the angle of elevation of the bottom of the flagstaff is α and that of the top of the

the
 flagstaff is β . Prove that the height of the tower is $\frac{h \tan \alpha}{\tan \beta - \tan \alpha}$

25. There are 360 students in Class X at a Kendriya Vidyalaya and they travel to the Vidyalaya by the following means:
- 130 students travel on foot
 - 125 students travel by bus
 - 70 students travel by cycle
 - 35 students travel by car.
- Represent this information on a pie chart.