

General Instructions :

1. Attempt all questions.
2. Section A – Questions 1 to 6 for 1 mark each.
3. Section B – Questions 7 to 12 for 2 marks each
4. Section C – Questions 13 to 22 for 3 marks each
5. Section D – Question 23 to 30 for 4 marks each

SECTION A (6x1=6 marks)

Q.1. For what value of K will the following pair of linear equations be inconsistent?

$$2x + ky = 8$$

$$kx + 8y = 16$$

Q.2. If $\tan A = \frac{4}{3}$ then find the value of $2 \sec^2 A - 1$

Q.3. For the A.P. $-50, -47, -44, \dots$ find the value of $a_{30} - a_{20}$

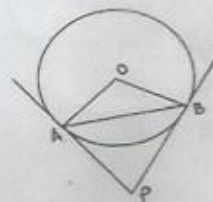
Q.4. In the given figure, O is the

Centre of the circle of radius 4cm.

Chord AB is equal to 4 cm. Tangents

At points A and B meet at point P.

Find the measure of angles APB.

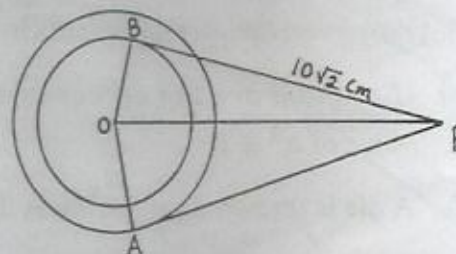


Q.5. Write a quadratic polynomial whose zeroes are $2 \pm \sqrt{3}$

Q.6. A number is chosen at random from the numbers $-3, -2, -1, 0, 1, 2, 3$. What will be the probability that square of this number is greater than or equal to 1?

SECTION B (6x2=12 marks)

Q.7. In the figure, there are two concentric circles of radii 5 cm and 9 cm. O is the centre. If the length of $PB = 10\sqrt{2}$ cm, find the length of tangent PA.



Q.8. Evaluate : $\operatorname{cosec} 30^\circ \sin 60^\circ \tan 30^\circ + \cos 60^\circ \cot 45^\circ$

Q.9. If the polynomial $x^4 + 2x^3 + 8x^2 + 12x + 18$ is divided by another polynomial $x^2 + 5$, the remainder comes out to be $ax + b$. Find the values of a and b .

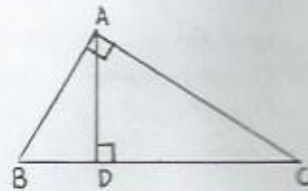
Q.10. Draw a line segment of length 9 cm. Through construction divide it in the ratio of 2 : 4

Q.11. Two dice are thrown together. Find the probability that the product of the number appeared is greater than 20.

Q.12. In the Given figure, $\angle BAC = 90^\circ$,

$AD \perp BC$. If $BD = 2$ cm and

$CD = 8$ cm, find AD .



SECTION C (10x3=30 marks)

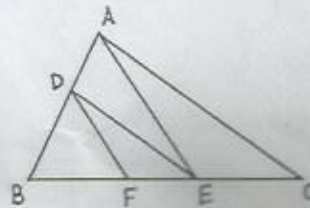
Q.13. Solve for x and y :

$$\frac{x}{a} - \frac{y}{b} = a - b, \quad ax + by = a^3 + b^3$$

Q.14. In the given figure $DE \parallel AC$

and $DF \parallel AE$.

Prove that $\frac{BF}{FE} = \frac{BE}{EC}$



Q.15. Prove that : $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} + \sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = 2\sec\theta$

Q.16. If $x = a \sec\theta + b \tan\theta$ and $y = a \tan\theta + b \sec\theta$ prove that $x^2 - y^2 = a^2 - b^2$

Q.17. Find the sum of first n terms of the series

$$\left(4 - \frac{1}{n}\right) + \left(4 - \frac{2}{n}\right) + \left(4 - \frac{3}{n}\right) + \dots \dots \dots$$

Q.18. Prove that the parallelogram circumscribing a circle is a rhombus.

Q.19. if α and β are the zeroes of the polynomial $f(x) = 3x^2 + 5x - 2$, then find the value of $\alpha^3 + \beta^3$

Q.20. A die is thrown twice. What is the probability that

(i) 5 will not come up either time?

(ii) 5 will come up atleast once?

Q.21. D, E and F are respectively the mid points of sides AB, BC and CA of ΔABC . Find the ratio of area of ΔDEF to area of ΔABC .

Q.22. Construct two concentric circles of radii 3 cm and 5 cm. From a point P at a distance of 8.3 cm from the centre, draw tangents to the inner circle.

SECTION D (8x4=32 marks)

Q.23. Solve the following system of linear equations graphically :

$$2x + y + 6 = 0 ; 3x - 2y + 2 = 0$$

Find the vertices of the triangle formed by the lines representing the above equations and x axis. Also find the area of the triangle so formed.

Q.24. Obtain all the zeroes of the polynomial $p(x) = 3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its

zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$. $-1, -1$

Q.25. Prove that :

$$\frac{\tan\theta}{1-\tan\theta} - \frac{\cot\theta}{1-\cot\theta} = \frac{\cos\theta+\sin\theta}{\cos\theta-\sin\theta}$$

Q.26. l and m are two parallel tangents to a circle with centre O . Another tangent AB , with point of contact C , intersects l at A and m at B . Prove that the tangent AB subtends a right angle at O .

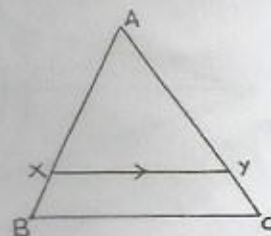
Q.27. The sum of first six items of an AP is 42. The ratio of its 10th term to the 30th term is 1:3. Calculate the first and the 13th term of the AP. 26

Q.28. If p times the p^{th} term of an AP is equal to q times the q^{th} term, find the $(p+q)^{\text{th}}$ term of the A.P. 0

Q.29. A man invested some amount at the rate of 10% simple interest and some other amount at the rate of 12% simple interest. He received yearly interest of Rs. 5000. But if he had interchanged the amounts invested, interest received would have been Rs. 100 less than in the earlier case. How much amount did he invest at different rates? $20,000, 21,000$

Q.30. A man owns a triangular piece of land. He divided it into two parts by drawing a line parallel to one side as shown in the figure ($XY \parallel BC$).

$$\frac{\text{area of } \Delta AXY}{\text{area of } XYCB} = \frac{25}{11}$$



On the triangular piece of land thus formed (ie ΔAXY),

he opened a night shelter for the homeless.

- (i) Calculate what fraction of AB is AX $5/6$
- (ii) By opening a night shelter what human value has the man shown?