by Ullas Krishnan

Class-X CBSE

1. Prove that $2\left(\sin^6\theta + \cos^6\theta\right)-3\left(\sin^4\theta + \cos^4\theta\right)+1=0$

2. Solve $2^{2x+8} + 1 = 32^{2x}$

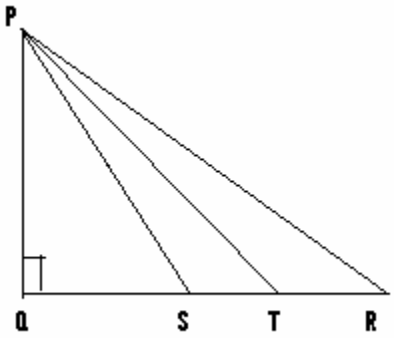
3. Find the sides of an equilateral triangle inscribed in a circle of radius 6cm.

4. If $\cos\theta - \sin\theta = 1$, show that $\cos\theta + \sin\theta = 1$ or -1

5. A factory kept increasing it's output by the same % every year. Find the % if it is known that the doubled over last two years.

6. Internal and external diameters of a hemispherical vessel are 24cm and 25cm. Find the cost of painting the vessel at the rate of 5p/cm^2.

7. Given: S and T trisect QR. Prove that $8PT^2 = 3PR^2 + 5PS^2$



8. Prove the angle bisector theorem.

9. Prove that the quadrilateral formed by joining the midpoints a rhombus is a cyclic quadrilateral.

10. ABCD is a quadrilateral with diagonals AD and BC intersecting at O. Prove that ar(ABC)/ar(BCD)=AO/BO

11. Divide 32 into 4 parts such that they are in AP and the ratio of the product of first term and fourth terms = product of second and third terms is equal to 7/15.

12. Derive the formula for the first 'n' terms of an AP whose first term is 'a' and common difference is 'd'.

13. The mean weight of 25 girls is 40 kgs. If the weight of a man is added, the mean weight increases by 500 gms. Find the weight of the man.

14. If the pth, qth, rth terms of an AP are a, b, c then prove a(q-r)+b(r-p)=c(q-p)

15. Students of a class are made to stand in rows. If one student is increased in each row, the no of rows decreases by 2. If one student is decreased in one row, the no of becomes 3 more. Find the total no of students.

16. A man borrows Rs.8200 on compound interest and returns it in 'n' years. If the R%=5% and each installment is Rs 4410, find 'n'.

17. Prove that the bisectors of the angles formed by producing the opp. sides of a cyclic quad are perpendicular to each other.

18. Given a trapezium ABCD with AB//CD and a pt.E on DC such that $\triangle$AED similar to $\triangle$BEC. Prove that AD=BC.

19. Two dice are thrown together . What is the probability that the sum of the numbers on the 2 faces is neither 9 nor 11.

20. Each edge of a cube is increased by 50%. Find the % increase in total surface area.

21. PT is a tangent and PAB a secant. If the bisector of angle ATB meets AB at M, prove that PT=PM.

22. The diameter of a roller 120cm long is 84cm. If it takes 500 complete revolutions to level a playground determine the cost of leveling at the rate of 30p/m^2.

23. A 4cm cube is cut into 1cm cubes. Find the ratio of the surface area of small cubes to that of the large cube.

24.The length of a string between a kite and a pt on the roof of the building 10m high is 180m. If the string makes an angle θ with the level ground such that $\tan\theta = 4/3$ how high is the kite from the ground?

25.Two circles touch internally at a pt.P and a chord AB of the larger circle intersects the other circle at C and D. Prove that

$\angle CPA = \angle DPB$.

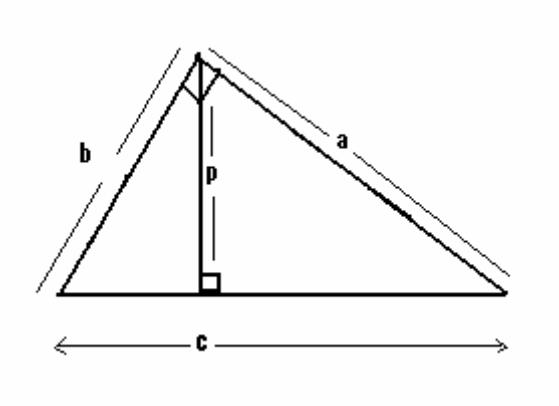
26.PP' and QQ' are two direct common tangents to two circles intersecting in points A and B. The common chord intersects PP' in R and QQ' in S. Prove $RS^2 = PP'^2 + AB^2$

27. A circle touches the side BC of $\triangle ABC$ at P and AB,AC produced at Q and R respectively. Prove that AQ is half the perimeter of $\triangle ABC$.

28.Prove that quad formed by the angle bisectors of a cyclic quad is also cyclic.

29.Prove that the centroid and the circumcentre of an equilateral triangle coincide.

30. In the given figure prove that (i)$pc = ab$ (ii)$1/p^2 = 1/a^2 + 1/b^2$



Best of Luck!!!!

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