PRACTICE QUESTIONS
SUBJECT - MATHEMATICS
CLASS – X

General Instructions:

1. All questions are compulsory.
2. The question paper consists of 31 questions divided into 4 sections, section A, B, C, and D.
3. Section A contains 4 questions of 1 mark each. Section B contains 6 questions of 2 marks each. Section C contains 10 questions of 3 marks each and section D contains 11 questions of 4 marks each.
4. There is no overall choice in the question paper.
5. Use of calculator is not permitted.
6. Draw figures & graphs wherever needed.

Section A (1 mark each)

Q1. If discriminant of a quadratic eqation is more then zero but not a perfect square number then its roots are real, _____ and _____ .

Q2. The tangents drawn at the end points of a diameter are always _____.

Q3. If the height of a tower is equal to the length of its shadow then find the angle of elevation of the Sun.

Q4 List all possible outcomes when two coins are tossed together.

Section B (2 marks each.)

Q5. Find the roots of quadratic equation $2x^2 - 7x + 6 = 0$ using quadratic formula.
Q6. Which term of A.P 2,5,8……. is 152.
Q7. Find the radius of the incircle of a right angled triangle if two of its perpendicular sides are 3cm and 4 cm respectively.
Q8. Find the length of the tangent from a point 13 cm away from the center of a circle of radius 5 cm.
Q9 Find abscissa of point A(x, 3) if its distance from point B (5, 7) is 5 unit.
Q10 Find value of K if (2,k) , (6,8) and (10,12) are collinear.

Section C (3 marks each)

Q11. Solve the equation by completing the square method $9x^2$-15x+6=0.

Q12. Find the sum of all three digits numbers which are divisible by 7.

Q13. The angles of elevations of the top of the tower from two points at distances a and b from the base and in same straight line with it are complementary. Prove that the height of the tower is $\sqrt{ab}$.

Q14. Find the probability that a leap year has 53 Sundays or 53 Monday?

Q15. By analytical method (using co-ordinate geometry) prove that the length of line segment joining the mid points of any two sides of a triangle is half of the length of the third side of the triangle.

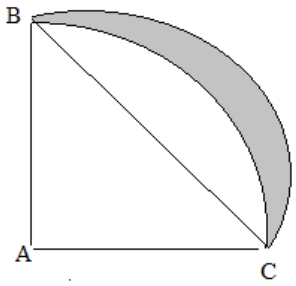
Q16. The diameter of a metallic sphere is 6 cm. It is melted & drawn into a wire having diameter of the cross-section as 0.2 cm. Find the length of the wire.

Q17. A right triangle ABC with its perpendicular sides 7 and 24 cm is revolved about its hypotenuse. Find the TSA and Volume of the solid so obtained.

Q18. A cone, a hemisphere & a cylinder stand on equal bases & have the same height. Show that their volumes are in the ratio 1: 2: 3.

Q19. A steel wire when bent in the form of a square, encloses an area of 121 sq. cm. The same wire is bent in the form of a circle. Find the area of the circle.

Q20. In the given figure, ABC is a quadrant of a circle of radius 14cm and a semicircle is drawn with BC as diameter. Find the area of the shaded region.

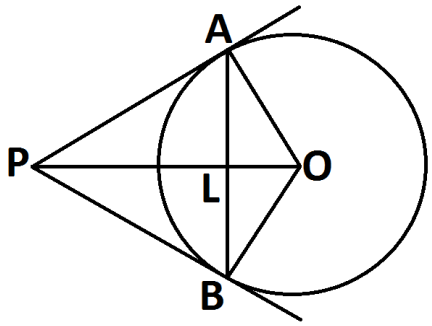


Section D (4 marks each)

Q21. Solve $\sqrt{x+1} + \sqrt{x+3} = 4$

Q22. An aeroplane left 30 minutes later than its scheduled time and in order to reach destination 1500 km away in time the pilot has to increase its speed by 250km/hr from its usual speed .Determine its usual speed. Which value is depicted by the pilot here?

Q23. In the given figure AB is a chord of length of 16 cm of a circle of radius 10 cm. The tangents at A and B intersect at point P. Find the length of PA.



Q24. AB is a line segment and M is its mid point. Semicircles are drawn with AM, MB and AB as diameters on the same side of the line AB. A circle $C(O, r)$, is drawn so that it touches all the three semicircles. Prove that $r = \frac{1}{6} AB$.

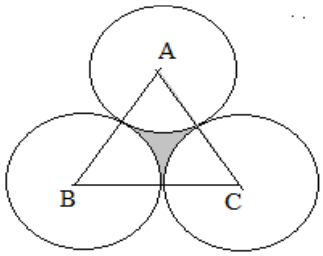
Q25. If m times of m^{th} term of an A.P. is equal to n times of n^{th} term of the same A.P. then prove that its $(m+n)^{th}$ term is zero.

Q26. Find the ratio in which the line segment joining the points (6,4) and (1,-7) is divided by x-axis. Find the coordinates of the point of contact also.

Q27. A vertical tower stands on a horizontal plane and is surmounted by a vertical flag staff of a height h. At a point on a plane the angles of elevation of the bottom and the top of the flag staff are α and β respectively. Prove that the height of the tower is $\frac{h \tan \alpha}{\tan \beta - \tan \alpha}$

Q28. Construct a triangle with sides 4cm,5cm and 6cm and then a triangle similar to it whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle. Also justify the construction.

Q29. The area of the equilateral triangle ABC is 17320.5 cm^2. With each vertex of the triangle as centre, a circle is drawn with radius equal to half the length of the side of the triangle. Find the area of the shaded region. (Use π=3.14 and $\sqrt{3}$=1.73205)



Q30. A hollow cone is cut by a plane parallel to the base & the upper portion is removed. If the curved surface of the remainder is 8/9 of the curved surface of the whole cone, find the ratio of the line-segment into which the cone's altitude is divided by the plane.

Q31 Three coins are tossed together. Find the probability of getting

(i) exactly 2 heads
(ii) at least 2 heads
(iii) at most 2 heads
(iv) no tails.

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