SUMMATIVE ASSESSMENT - I, 2016 -17 MATHEMATICS - Class - X Question paper – 4 [Code: 22Q88FM]

Time Allowed: 3 hours Maximum Marks: 90

SECTION – A

1.If ΔAABC ~ Δ PQR, AB = 6.5 cm, PQ = 10.4 cm and perimeter of ΔABC = 60 cm, then find the perimeter of APQR.

2. If sinθ - cosθ = 0, find the value of 0.

3. Find the value of $(\text{cosec}^2\theta - 1).\tan^2\theta$

4. In the following distribution, find upper limit of median class :

Class interval	0 - 8	8-16	16 - 24	24 - 32	32 - 40	40 - 48
Frequency	7	9	10	8	12	8

SECTION - B

5. Show that $(\sqrt{3-} + \sqrt{5})^2$ is an irrational number.

6. Find the HCF of 95 and 190 by Prime Factorisation method.

7. If zeroes α and β of a polynomial x^2 — 7x + k are such that α — β =1, then find the value of k.

8. If D and E are points, on the sides AB and AC of Δ ABC such that AD = 6 cm, BD = 9 cm, AE = 8 cm, he. 12 cm, Prove that DEIIBC.

9. Prove that: $\frac{\cos\theta}{1 - \sin\theta} = \frac{1 + \sin\theta}{\cos\theta}$

10. Calculate the mode of the following data:

Class - interval	100-200	200- 300	300- 400	400- 500	500-600	600-700
Frequency	18	15	23	55	87	29

SECTION – C

11. An army contingent of 678 soldiers is to march behind an army band of 36 members in a Republic Day parade. The two groups are to march in the same number of columns. What is the maximum number of columns they can march ?

12. Solve for x and y : 7x — 5y = 2 x + 2y = 3

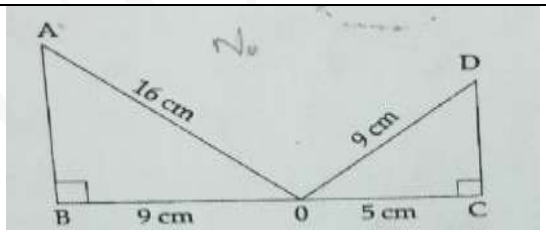
13. If one zero of a polynomial x^3 — $8x^2$ +19x-12 is 4, then find all the zeroes

14. 2x =5y +4 is given. Write another linear equation, so that the lines represented by the pair are (i) intersecting (ii) coincident (iii) parallel

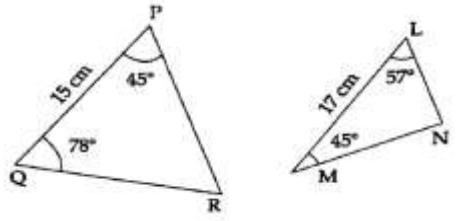
15. ABC is an isosceles triangle. If <B = 90°, then prove that $AC^2 = 2BC^2$.

16. State whether the given pairs of triangles are similar or not. In case of similarity mention the criterion.

(a)



(b)



17. If 3 tan A = 4, then prove that : (i) $\sqrt{\frac{\sec A - \text{cosec } A}{\sec A + \text{cosec } A}} = \frac{1}{\sqrt{7}}$ (ii) $\sqrt{\frac{1 - \sin A}{1 + \cos A}} = \frac{1}{2\sqrt{2}}$

18. Prove that: $(\cot\theta - \text{cosec}\theta)^2 = \frac{1 - \cos\theta}{1 + \cos\theta}$

19. Find the mean and median for the following data:

Class	0 – 4	4 - 8	8 - 12	12 – 16	16 -18
Frequency	3	5	9	5	3

20. Find the mean of the following distribution:

Class interval	Below 20	Below30	Below 40	Below50	Below60	Below 70	Below80	Below 90	Below 100
Frequency	8	15	27	50	61	74	82	88	100

SECTION – D

21. Write the HCF and LCM of the smallest odd composite number and the smallest odd prime number. If an odd no. p divides q^2 then will it divide q^3 also? Explain.

22. if 4 chairs and 3 tables cost Rs. 2100 and 5 chairs and 2 tables cost Rs. 1750. Find the cost of one chair and one table separately.

23. If the polynomial f (x) = $3x^4$ — $9x^3$ + x^2+ 15x + k is completely divisible by $3x^2$ — 5, find the value of k and hence the other two zeroes of the polynomial.

24. Rajesh donated some money and books to a school for poor children. Money and books can be represented by the zeroes (ie. α,β) of the polynomial p(x) = $2x^2$ — 5x + 7. Akshita who is a friend of Rajesh, also got inspired by him and donated the money and books in the form of a polynomial whose zeroes are (2α + 3β) and (3α + 2β). Find the polynomial whose zeroes are (2α + 3β) and (3α + 2β). Why did Akshita got inspired by Rajesh?

25. State and prove Pythagoras theorem. Using the above theorem find the third side of a right triangle whose hypotenuse is of length 'p' cm, one side of length q cm and p — q = 1.

26. Prove that if a line is drawn parallel to one side of triangle to intersect the other two sides in distinct points the other two sides are divided in the same ratio.

27. Without using trigonometric table, evaluate :

[($\cos^2 35°$ + $\cos^2 55°$)/($\operatorname{cosec}^2 15°$ — $\tan^2 75°$)] + √3 (tan13°.tan23°.tan30°.tan67°.tan77°)

28. If m = cosec A – sinA and n = secA - cosA, prove that $(m^2n)^{\frac{2}{3}} + (mn^2)^{\frac{2}{3}} = 1$

29. if cosθ - sinθ =√2sinθ, then prove that cosθ + sinθ = √2 cosθ

30. In a class, tests, marks (out of 80) of students are given in the following data:

Marks(less than)	>20	>30	> 40	> 50	>60	>70	> 80
Number of students	4	12	22	34	44	48	50

Draw a 'less than type' ogive for the above data and from the curve, find median and verify the result.

31. The mean of the following frequency distribution is 62.8 and the sum of all frequencies is 50. Compute the missing frequencies f_1 and f_2 :

Class interval	0 — 20	20 — 40	40— 60	60 — 80	80 —100	100 —120	Total
Frequency	5	f_1	10	f_2	7	8	50