

ST. ARNOLD'S CENTRAL SCHOOL, PUNE
PERIODIC TEST - 2, 2017 - 18
SUBJECT : MATHEMATICS

STD : X

M.M : 80

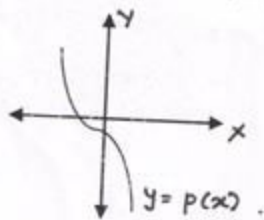
General Instructions :

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into four sections A, B, C and D.
3. Section A contains 6 questions of 1 mark each. Section B contains 6 questions of 2 marks each. Section C contains 10 questions of 3 marks each. Section D contains 8 questions of 4 marks each.
4. Use of calculators is not permitted

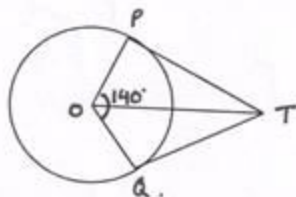
SECTION - A

Question numbers 1 to 6 carry 1 mark each.

1. After how many places of decimal, will the decimal expansion of the rational number $\frac{47}{2^{2.5}}$ terminate. (1)
2. Find a quadratic polynomial, the sum and product of whose zeroes are 0 and $\sqrt{5}$ respectively. (1)
3. Find the number of zeroes of the polynomial $y = p(x)$ from the following graph. (1)



4. If $\sin(3A) = \cos(A+26)^\circ$, where A and $(A+26)^\circ$ are acute angles, find the value of A. (1)
5. TP and TQ are tangents to the circle with centre O, such that $\angle POQ = 140^\circ$. Find $\angle PTO$. (1)



6. Identify the modal class for the following frequency distribution : (1)

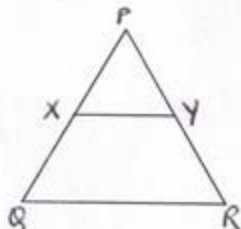
Age	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
No. of patients	16	13	6	11	27	18

SECTION - B

Question numbers 7 to 12 carry 2 marks each.

7. Find the H.C.F of 867 and 255 using Euclid's division lemma. (2)
8. Solve : $x + y = 4$ and $x - 2y = 5$ using elimination method. (2)
9. Find the value of 'p' for which the following system of equations have no solution :
 $(2p - 1)x + (p - 1)y = 2p + 1$
 $y + 3x - 1 = 0$ (2)

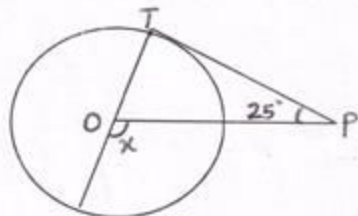
10. In the given figure $XY \parallel QR$, $PR = 6.3$ cm and $\frac{PQ}{XQ} = \frac{7}{3}$. Find YR. (2)



11. Find the median class for the following distribution : (2)

Class Interval	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Frequency	6	10	12	8	7

12. In the figure PT is a tangent of the circle with centre O, and $\angle TPO = 25^\circ$, then find 'x'. (2)



SECTION - C

Question numbers 13 to 22 carry 3 marks each.

13. If α and β are zeroes of the polynomial $x^2 - 6x + a$ and $3\alpha + 2\beta = 20$, then find the value of 'a'. (3)
14. Places 'A' and 'B' are 100 k.m apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of both the cars. (3)

15. Solve for x and y :

$$\frac{5}{x-1} + \frac{1}{y-2} = 2 \quad ; \quad \frac{6}{x-1} + \frac{3}{y-2} = 1 \quad (x \neq 1 ; y \neq 2) \quad (3)$$

16. Evaluate : $\frac{\tan^2 60 + 4 \sin^2 45 + 3 \sec^2 30 + 5 \cos^2 90}{\operatorname{cosec} 30 + \sec 60 - \cot^2 30}$

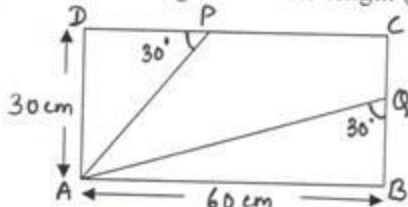
(3)

17. If $\operatorname{cosec} A = \frac{13}{12}$, then evaluate : $\frac{2 \sin A - 3 \cos A}{4 \sin A - 9 \cos A}$

(3)

18. In the figure ABCD is a rectangle. Find the length (AP + AQ).

(3)



19. The mean of the following data is 7.5. Find the value of 'p'

(3)

Class Interval	2 - 4	4 - 6	6 - 8	8 - 10	10 - 12	12 - 14
Frequency	6	8	15	p	8	4

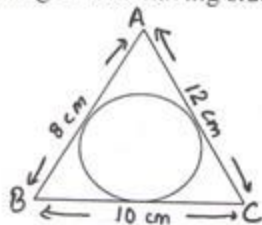
20. Find the mode of the given data :

(3)

Class Interval	0 - 20	20 - 40	40 - 60	60 - 80
Frequency	15	6	18	10

21. A circle is inscribed in a triangle ABC having sides 8 cm, 10 cm and 12 cm. Find the lengths of the tangents.

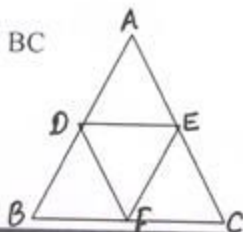
(3)



22. Prove that $\operatorname{ar}(\triangle ABC) = 4 \operatorname{ar}(\triangle DEF)$

(3)

If D, E, and F are the mid points of sides AB, AC and BC respectively.



SECTION - D

Question numbers 23 to 30 carry 4 marks each

23. Check whether the polynomial $g(x) = x^3 - 3x + 1$ is a factor the polynomial $p(x) = x^5 - 4x^3 + x^2 + 3x + 1$ (4)

24. Prove that : $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$ (4)

25. A circle touches the sides of a quadrilateral ABCD at the points P,Q,R,S. Prove that the angle subtended at the centre by the pairs of opposite sides are supplementary. (4)

26. If the median of the following data is 525 and the sum of the frequencies is 100, then find the values of x and y. (4)

Class Interval	0 - 100	100 - 200	200 - 300	300 - 400	400 - 500	500 - 600	600 - 700	700 - 800	800 - 900	900 - 1000
Freq	2	5	x	12	17	20	y	9	7	4

27. The following distribution gives the monthly consumption of electricity of 68 consumers of a locality :

Monthly consumption (in units)	65 - 85	85 - 105	105 - 125	125 - 145	145 - 165	165 - 185	185 - 205
No. of consumers	4	5	13	20	14	8	4

Convert the above distribution to less than type cumulative frequency distribution , draw its ogive and find the median from the graph. (4)

28. Solve graphically : $x - y = 1$; $2x + y = 8$.
Shade the region bound by these lines and the y - axis. Also find the area of this region. (4)

29. Prove that : $\frac{1}{\sec A - \tan A} - \frac{1}{\cos A} = \frac{1}{\cos A} - \frac{1}{\sec A + \tan A}$ (4)

30. State and prove the Pythagoras theorem. (4)