

Name of the Student : _____ Roll No.:

--	--	--	--	--	--	--

Name of the School : _____ Date : _____

Class : _____ Subject: Mathematics Time: 60 Min

Instructions to the Candidate

1. Each question carries 1 mark. There is no negative marking.
2. Separate Optical Mark Reader (OMR) Answer Sheet is supplied to you along with question paper booklet.
3. Read the questions carefully and fill in the circle corresponding to your answer. Fill in the circle Completely.
4. Rough work should be done only in the space provided in the Question Paper Booklet.
5. Return the OMR Answer sheet to the invigilator before leaving the examination hall.
6. You can carry the question paper with you after completing the examination.
7. Once you enter the examination hall, you are not permitted to leave till the end of the examination.

X Class Mathematics

1. If $3^{1+x} + 3^{1-x} = 10$ then $x =$ _____
(A) 1 (B) 3 (C) 2 (D) 4
2. If $\log(a+c) + \log(a-2b+c) = 2\log(a-c)$ then a, b, c are in _____
(A) A.P. (B) G.P. (C) H.P. (D) None of these
3. The remainder when $1+x+x^2+x^3+\dots+x^{2020}$ is divided by $x-1$ is _____
(A) 2019 (B) 2020 (C) 2021 (D) 2022
4. The number of divisors of the number 8800 is _____
(A) 30 (B) 36 (C) 38 (D) 44
5. If $x \cdot x \cdot x \cdot x \cdot x \dots (2021 \text{ times}) = x^y$ and $3^y + 3^y + 3^y = 3^z$ then $z =$ _____
(A) 2023 (B) 2022 (C) 2021 (D) 2021^2
6. If α, β, γ are the zeroes of the polynomial $f(x) = ax^3 + bx^2 + cx + d$, then $\alpha^2 + \beta^2 + \gamma^2 =$ _____
(A) $\frac{b^2 - ac}{a^2}$ (B) $\frac{b^2 - 2ac}{a}$ (C) $\frac{b^2 + 2ac}{b^2}$ (D) $\frac{b^2 - 2ac}{a^2}$

7. If the n^{th} term of an A.P. be $\frac{1}{n}$ and n^{th} term be $\frac{1}{m}$, then $(mn)^{\text{th}}$ term is _____
- (A) 4 (B) 3 (C) 2 (D) 1
8. If θ is an acute angle and $\tan\theta + \cot\theta = 2$, then the value of $\tan^7\theta + \cot^7\theta$ is
- (A) 1 (B) 2 (C) 7 (D) 128
9. The value of $\cos 1^\circ \cdot \cos 2^\circ \cdot \cos 3^\circ \dots \dots \dots \cos 180^\circ$ is _____
- (A) -1 (B) 1 (C) 0 (D) 2
10. The ratio in which the x-axis divides the segment joining (3,6) and (12, -3) is _____
- (A) 2 : 1 (B) 1 : 2 (C) -2 : 1 (D) 1 : -2
11. The areas of two similar triangles ABC and PQR are in the ratio 9 : 16.
If BC = 4.5 cm then the length of QR = _____
- (A) 20.25 cm (B) 25 cm (C) 6 cm (D) 2.5 cm
12. If ABC is a right triangle right angled at B and M, N are mid points of AB, BC respectively, then $4(AN^2 + CM^2) =$ _____
- (A) $4AC^2$ (B) $5AC^2$ (C) $\frac{5}{4}AC^2$ (D) $6AC^2$
13. The length of the tangent drawn from a point 8 cm away from the centre of a circle of radius 6 cm is _____
- (A) $\sqrt{7}$ cm (B) $2\sqrt{7}$ cm (C) 10 cm (D) 5 cm
14. A wheel has diameter 84 cm. How many complete revolutions must it take to cover 792 meters _____
- (A) 3 (B) 30 (C) 300 (D) 3000
15. A solid piece of iron of dimensions $49\text{cm} \times 33\text{cm} \times 24\text{cm}$ is molded into a sphere. The radius of the sphere is _____
- (A) 21 cm (B) 28 cm (C) 35 cm (D) 42 cm
16. Let a, b, x, y be real number such that: $a + b = 23$; $ax + by = 79$;
 $ax^2 + by^2 = 217$; $ax^3 + by^3 = 691$, what is the value of $ax^4 + by^4$?
- (A) 691 (B) 1993 (C) 908 (D) 3991
17. In a foot ball match, Ronaldo makes 4 goals from 10 penalty kicks. The probability of converting a penalty kick into a goal by Ronaldo is _____
- (A) $\frac{1}{4}$ (B) $\frac{1}{6}$ (C) $\frac{1}{3}$ (D) $\frac{2}{5}$

18. If $\frac{a}{b} + \frac{b}{a} = -1$ then $a^3 - b^3 =$ _____

- (A) 1 (B) -1 (C) $\frac{1}{2}$ (D) 0

19. The 6th term of G.P. is 24, its 13th term is $\frac{3}{16}$, then 20th term of G.P. is _____

- (A) $\frac{3}{1024}$ (B) $\frac{3}{2048}$ (C) $\frac{3}{512}$ (D) $\frac{9}{1025}$

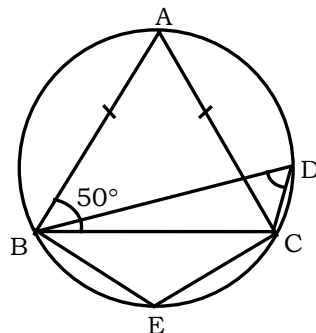
20. No. of rectangles on a chess board which are not squares = _____

- (A) 1296 (B) 204 (C) 1092 (D) 1024

21. If the roots of $x^3 - 7x^2 + 14x + k = 0$ are in G.P. then $k =$ _____

- (A) -8 (B) 8 (C) 7 (D) -7

22. In the adjacent figure ABC is an isosceles triangle in which $AB = AC$ and $\angle ABC = 50^\circ$ then $\angle BDC =$ _____

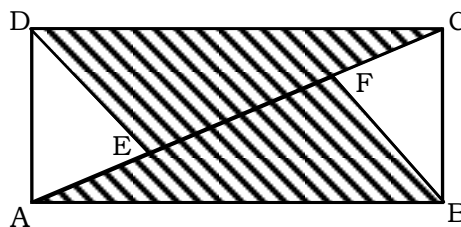


- (A) 80° (B) 60° (C) 65° (D) 100°

23. The three digit number XYZ when divided by 8, gives as quotient the two digit number ZX and remainder Y. The number XYZ is

- (A) 4350 (B) 126 (C) 535 (D) 435

24. ABCD is a rectangle of dimensions 6 cm \times 8 cm. DE and BF are the perpendiculars drawn on the diagonal of the rectangle. What is ratio of the shaded to that of unshaded region?

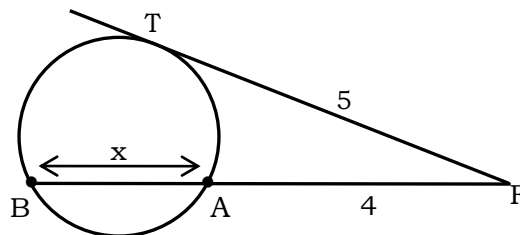


- (A) 7 : 3 (B) 16 : 9 (C) $4 : 3\sqrt{2}$ (D) data insufficient

25. The value of $\left(\sqrt{\sqrt{72 + \sqrt{72 + \sqrt{72 + \dots \infty}}}}\right) \div \left(\sqrt{\sqrt{12 - \sqrt{12 - \sqrt{12 - \dots \infty}}}}\right) =$ _____

- (A) -3 (B) 3 (C) 4 (D) -4

26. If $2x + \frac{2}{x} = 1$ then the value of $x^3 + \frac{1}{x^3} =$ _____
- (A) $\frac{13}{8}$ (B) $\frac{-11}{8}$ (C) $\frac{11}{8}$ (D) $\frac{-13}{8}$
27. Tendulkar has a certain average for 11 innings. In the 12th innings he scores 120 runs and there by increases his average by 5 runs. His new average is _____
- (A) 60 (B) 62 (C) 65 (D) 66
28. In a group of 1000 people there are 750 people who can speak Hindi and 400 who can speak English. How many can speak Hindi only?
- (A) 600 (B) 650 (C) 750 (D) 800
29. An escalator moves up at a constant rate. John walks up the escalator at the rate of one step per second and reaches the top in twenty seconds. The next day John's rate was two steps per second, and he reached the top in sixteen seconds. The number of steps in the escalator is _____.
- (A) 76 (B) 80 (C) 86 (D) 90
30. If $5\cos\theta + 12\sin\theta = 13$ then $\tan\theta =$ _____
- (A) $\frac{13}{12}$ (B) $\frac{12}{13}$ (C) $\frac{12}{5}$ (D) $\frac{5}{12}$
31. Find x, from the adjacent figure



- (A) 4 (B) 9 (C) $\frac{4}{9}$ (D) $\frac{9}{4}$
32. An ogive curve is used to determine _____
- (A) A.M. (B) H.M. (C) Mode (D) Median
33. If the points (P, 2), (-3, 4) and C (7, -1) are on same line P = _____
- (A) 1 (B) 2 (C) 3 (D) 0
34. The line joining the points (2, 1) and (5, -8) is trisected at the points P and Q. If point P lies on the line $2x - y + k = 0$ then $k =$ _____
- (A) -8 (B) 8 (C) 4 (D) -3
35. 40% of $1640 + x = 35%$ of $980 + 150%$ of 850. What is 'x'?
- (A) 372 (B) 842 (C) 962 (D) 1052

36. Let x and y be real numbers satisfying $x^4y^5 + y^4x^5 = 810$ and $x^3y^6 + y^3x^6 = 945$. Then the value of $2x^3 + x^3y^3 + 2y^3$ is _____
(A) 90 (B) 1755 (C) 89 (D) 945
37. The ratio of an interior angle of a regular pentagon to an exterior angle of a regular decagon is
(A) 4:1 (B) 3:1 (C) 2:1 (D) 7:3
38. Ninety men can dig a well in 20 days. After they have worked for 5 days, how many more men should be employed so as to complete the work in another 10 days?
(A) 60 (B) 50 (C) 45 (D) 30
39. If $a = b^{3/y}$, $b = c^{4/x}$, $c = a^{5/z}$ then $xyz =$ _____
(A) 1 (B) 12 (C) 20 (D) 60
40. $\Sigma n = 55$ then $\Sigma n^3 =$ _____
(A) $(55)^3$ (B) $(55)^2 \times 55$ (C) 55×55 (D) $\Sigma 55$