



MATHEMATICS TALENT HUNT 2023

Organized by : The Pi Group of Mathematics(TPGM), Cooch Behar

Registration No. – S0031696 of 2022-23

Class – IX

Full Mark : 100

Time : 2 Hours.

Instructions

- There are 50 question of 2 marks each.
- Put tick mark ($\sqrt{}$) only on the correct alternative against each question in your answer sheet.
- There is no negative marking.

36. The part of the circle is bounded by an arc and a chord is called a:-
(a) Semi circle (b) Sector (c) Arc (d) Segment

37. If different values of variable x are 2.2, 9.5, 8.5, 10.5, 13, 10, 5.4 and 5.5.
Find the value of $\sum(x - \bar{x})$, where $\bar{x}$ = mean value of x .
(a) -1 (b) 0 (c) 0.2 (d) 5

38. Find the distance between the following pair of points: $(-a, -b)$ and (a, b) .
(a) $2\sqrt{(a^2 + b^2)}$ (b) $\sqrt{(a^2 + b^2)}$ (c) $\sqrt{2(a^2 + b^2)}$ (d) $2b$

39. Find the inclination of the line whose slope is 1.
(a) 45° (b) 65° (c) 60° (d) 90°

40. Evaluate: $\tan(32^\circ - 23x) - \cot(58^\circ + 23x)$.
(a) 0 (b) -1 (c) 1 (d) 2

41. State whether the following statement is true or false.
Statement: Every irrational number is a real number
(a) True (b) False (c) Can not be determined (d) None of these

42. Ramu borrows Rs. 74500 at 6% simple interest. He invests the amount at 9% interest per annum compounded semi-annually. At the end of 1 year how much does he gain?
(a) 151 (b) 2386 (c) 9543 (d) 6856

43. Find $a^{77} + \frac{1}{a^{67}}$ if $a + \frac{1}{a} = 2$. (a) 2 (b) 0 (c) -1 (d) -2

44. The sum of all exterior angles of a hexagon is: (a) 180° (b) 270° (c) 360° (d) 720°

45. Convert $1.\overline{345}$ into fraction. (a) $\frac{1345}{900}$ (b) $\frac{1332}{990}$ (c) $\frac{1345}{990}$ (d) $\frac{1332}{900}$

46. Solve the following system of equations:
 $(x + 5) + (5x + 3y) = 3y + 2;$ $\frac{2x+1}{3} + \frac{4y+3}{3} = 5x + 2$
(a) $x = -0.5$ (b) $x = -1.5$ (c) $y = -0.12$ (d) $x = -5.88$

47. Evaluate $\frac{a+b+c}{a^{-1}b^{-1}+b^{-1}c^{-1}+c^{-1}a^{-1}}$. (a) 1 (b) abc (c) 0 (d) $a + b + c$

48. If $\log(x^2 + 9999856) = 7$ the find the value of x .
(a) -12 (b) 144 (c) ± 12 (d) 12

49. The point concurrency of medians called:-
(a) Altitude (b) Orthocentre (c) Centroid (d) Centre

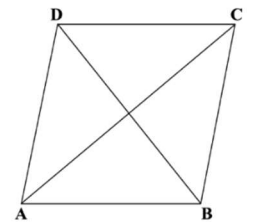
50. If the number $12x453$ is divisible by 9, then $x = ?$
(a) 1 (b) 2 (c) 3 (d) 4

← x →

1. The point (m,n) lies on the y-axis if m=_____
(a) Any Positive Integer (b) Can't be determined (c) 0 (zero) (d) Any negative Integer

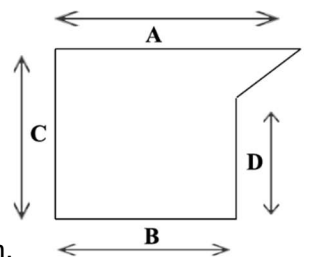
2. Evaluate: $\frac{\cot 40^\circ}{\tan 50^\circ} + \frac{\tan 24^\circ}{\cot 66^\circ} - 2$. (a) 0 (b) 1 (c) $\frac{1}{2}$ (d) 2

3. Find the length of the diagonal BD, given AB= 69cm. and $\angle BAD = 60^\circ$
(a) 69 cm. (b) 59.75 cm
(c) 59 cm (d) 34.5 cm



4. Find the value of A and B, if $\sin(4A + 8B) = \cos(9A - 8B) = \frac{\sqrt{3}}{2}$
(a) $A = 1^\circ, B = 3^\circ$ (b) $A = 6.92^\circ, B = 4.04^\circ$ (c) $A = 30^\circ, B = 45^\circ$ (d) $A = 37^\circ, B = 42.5^\circ$

5. The cross section of a piece of metal 4 cm. in length, is shown in the figure, if 1 cu.cm of the metal weighs 8g, calculate the weight of the piece of metal to the nearest Kg.
Given : A= 16cm, B= 8cm, C= 12cm D= 6cm
(a) 384 Kg (b) 960 Kg
(c) 461 Kg (d) 1152 Kg



6. Find the area of an isosceles triangle with Perimeter 30cm and base 14cm.
(a) 27.1 cm^2 (b) 56 cm^2 (c) 53.2 cm^2 (d) 70.7 cm^2

7. If the mean of 45 observations is 50 Later we find that the value of 70 was wrongly copied as 57. Find the corrected mean.
(a) 50.3 (b) 22.37 (c) 49.7 (d) 22.5

8. Suppose there is a number 15.5. There are class intervals 12.5—15.5 and 15.5—18.5. In which class interval you would put 15.5.
(a) -3 (b) Depend on conversation (c) -30 (d) Both the classes

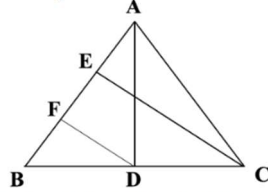
9. A circle passes through all the vertices of a polygon is called a_____
(a) Inscribed circles (b) circumscribed circles (c) Inscribed polygon (d) circumscribed polygons

10. Two parallelograms are on equal bases and between the same parallels. The ratio of their area is:
(a) 1:2 (b) 3:1 (c) 2:1 (d) 1:1

11. The angles A, B, C, D of a quadrilateral are in a ratio 1:3:7:9. The ABCD is a:
(a) Trapezium with $AB \parallel CD$ (b) Trapezium with $BC \parallel AD$ (c) Kite (d) Parallelogram

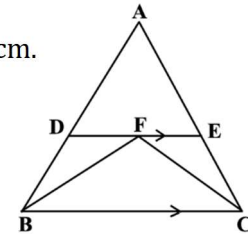
12. If AB is the longest side of the triangle ABC and $AB^2 > AC^2 + BC^2$. Choose the correct Statement:
 (a) $\angle ACB = 90^\circ$ (b) $\angle ACB < 90^\circ$ (c) $\angle ACB > 90^\circ$ (d) None of these

13. In the given figure AD and CE are medians and DF is Parallel to CE. Identify the correct statement.
 (a) $FB = \frac{1}{6}AB$ (b) $FB = \frac{1}{8}AB$
 (c) $FB = \frac{1}{4}AB$ (d) $FB = \frac{1}{3}AB$



14. If two sides of a triangle are 6cm. and 14cm. then the range of the length of the third side:
 (a) 6 and 20 (b) 14 and 20 (c) 6 and 8 (d) 8 and 20

15. In the given figure $DE \parallel BC$, Find the length DE, if $BD=7\text{cm}$, and $CE=9\text{cm}$.
 (a) 48cm (b) 32cm.
 (c) 16cm. (d) 63cm.



16. Evaluate $\frac{\log_4 8}{\log_{16} 8 \times \log_8 2}$ (a) $\frac{1}{6}$ (b) 6 (c) $-\frac{1}{6}$ (d) -6

17. If $\log_6 x = y$ find $6^{(3y+2)}$ in terms of x .

- (a) $36x^3$ (b) $36x^2$ (c) $36x$ (d) $-36x$

18. Compute: $8^2 + 8^3 + 8^0 + 64^{\frac{1}{2}} - (262144)^{\frac{1}{3}}$ (a) 521 (b) 528 (c) 649 (d) 520

19. Factorise: $2187 - 3x^3$

- (a) $3(9+x)(81-9x+x^2)$ (c) $(27-3x)(81-9x-x^2)$
 (b) $(27-3x)(81+9x+x^2)$ (d) $(27+3x)(81+9x+x^2)$

20. If $a^2 + \frac{1}{a^2} = 9$ find the value of $a - \frac{1}{a}$ (where $a > 0$) (a) $\sqrt{5}$ (b) $\sqrt{11}$ (c) 7 (d) $\sqrt{7}$

21. A sum of money lent out at compound interest becomes 4 times in 5 years. In how many years will it become 16 times in initial value?
 (a) 125 (b) 10 (c) 5 (d) 25

22. A number whose decimal expansion is non-terminating nonrecurring is
 (a) Irrational Number (b) Real Number (c) Rational Number (d) Natural Number

23. The sum of the digits of a 2-digit number is 15. If the digits are reversed and 27 is subtracted from it, the result is 1 time the original number. Find the original number.
 (a) 79 (b) 74 (c) 87 (d) 69

24. Evaluate $\frac{1}{1+x^4+x^2} + \frac{1}{1+x^{-4}+x^{-2}} + \frac{1}{1+x^2+x^{-2}}$ (a) x^2 (b) 0 (c) 1 (d) $(1+x^4)$

25. Sides opposite to _____ angles of a triangle are equal.
 (a) Greater (b) Equal (c) Smaller (d) None of these

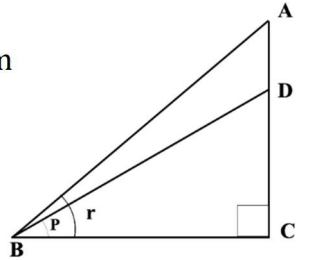
26. Solve for x where $\sin^2(2x) + \sin^2(32^\circ) = 1$ and $(0^\circ < x < 90^\circ)$.
 (a) 44 (b) 14 (c) 29 (d) can not be determined

27. Water is discharged from a pipe of cross-section area 3.8 cm^2 at the speed of 8 m/sec . Calculate the volume of the water discharged; in liters/minute.
 (a) 1.8 L (b) 182400L (c) 182.4L (d) 1824L

28. The diagonal of a rectangular plot is 38m. and its Perimeter is 96m. Find its area.
 (a) 430 m^2 (b) 860 m^2 (c) 3886 m^2 (d) 7772 m^2

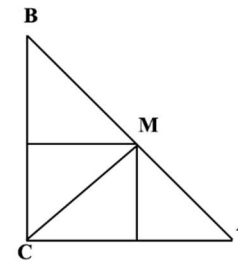
29. Given $5\sin B = 4$, Calculate $\frac{1}{\cos^2 B} - \tan^2 B$ (a) $\frac{5}{4}$ (b) 1 (c) 0 (d) $\frac{5}{3}$

30. Find the length of AD, Given $\angle ABC = 60^\circ$, $\angle DBC = 45^\circ$ and $BC = 34 \text{ cm}$
 (a) 34 (b) 24.89
 (c) 58.89 (d) 92.89



31. In a $\triangle XYZ$, $YZ = XZ$ and $\angle X = 42^\circ$ which is the longest side of the triangle?
 (a) XZ (b) XY (c) None of these (d) YZ

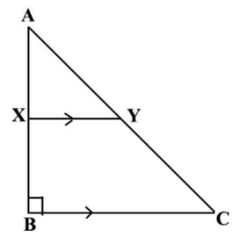
32. $\triangle ABC$ is a triangle right angled at C. A line through the mid-point M of hypotenuse $AB = 10 \text{ cm}$ and Parallel to BC intersects AC at D. Find CM.



- (a) 4cm. (b) 5cm.
 (c) 3cm. (d) 6cm.

33. In the given figure $\angle B = 90^\circ$, $XY \parallel BC$, $AB = 10 \text{ cm}$. $AY = 4 \text{ cm}$. and $AX : XB = 4 : 22$. Find the length of BC.

- (a) 26 (b) 96
 (c) 10 (d) 24



34. In a pentagon ABCDE, $AB \parallel BC$ and $\angle A : \angle E : \angle D = 5 : 4 : 6$ find $\angle E$.
 (a) 36° (b) 144° (c) 24° (d) 96°

35. The base BC of $\triangle ABC$ is divided at D so that $BD = \frac{1}{2}DC$. Identify the correct Statement.
 (a) None of these is ever possible (c) Can not be determined

- (b) $\text{Area}(\triangle ABD) = \frac{1}{3} \text{area}(\triangle ABC)$ (d) $\text{Area}(\triangle ABD) = \frac{1}{2} \text{area}(\triangle ABC)$