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MATH TALENT HUNT EXAMINATION – 2020
Organised by : The Pi (π) Group of Mathematics (TPGM)

Class – IX
F.M – 100

Time – 2 Hour

Instructions:

1. There are 50 questions of marks 2 each.
2. Put tick mark on the correct alternative against each question in your answer sheet.
3. There is no negative marking.

1. If $3^x - 3^{x-1} = 18$, then the value of x^x is –

- (a) 3 (b) 6 (c) 9 ☒ (d) 27

2. Simplify : $\frac{\sqrt[4]{1250}}{\sqrt[4]{2}}$

- ☒ (a) 5 (b) 25 (c) 125 (d) 250

3. If $x = \frac{2}{3+\sqrt{7}}$, find the value of $(x-3)^2$

- (a) 49 ☒ (b) 7 (c) $\frac{1}{7}$ (d) $3 - \sqrt{7}$

4. Simplify : $\left(\frac{4^{m+\frac{1}{4}} \times \sqrt{2.2^m}}{2 \cdot \sqrt{2^{-m}}} \right)^{\frac{1}{m}}$

- (a) 2 (b) 4 ☒ (c) 8 (d) $2\sqrt{2}$

5. What is the decimal expansion of $\frac{1}{17}$?

- ☒ (a) rational (b) irrational (c) both (d) none

6. The numbers π and $\frac{22}{7}$,

- (a) both rational (b) both irrational (c) π is rational and $\frac{22}{7}$ is irrational ☒ (d) π is irrational and $\frac{22}{7}$ is rational

7. A hemispherical bowl has a radius of 3.5 cm what would be the volume of water it would contain?

- ☒ (a) 89.8 cm^3 (b) 98.8 cm^3 (c) 88.9 cm^3 (d) 89.9 cm^3

8. The height and the slant height of a cone are 21 cm and 28 cm respectively. Find the volume of the cone.

- (a) 9546 cm^3 (b) 8564 cm^3 ☒ (c) 7546 cm^3 (d) 5564 cm^3

9. Find the curved surface area of a hemisphere of radius 21 cm

- ☒ (a) 2772 cm^2 (b) 2872 cm^2 (c) 2972 cm^2 (d) 3072 cm^2

10. The height of a cone is 16 cm and its base radius is 12 cm. Find the curved surface area. ($\pi = 3.14$)

- ☒ (a) 753.6 cm^2 (b) 754.6 cm^2 (c) 755.6 cm^2 (d) 756.6 cm^2

11. Find the value of $\sqrt{-\sqrt{3} + \sqrt{3 + 8\sqrt{7 + 4\sqrt{3}}}}$ is –

- (a) 6 (b) 5 ☒ (c) 4 (d) 0

12. Determine the value of $\sqrt{12 - \sqrt{12 - \sqrt{12 - \dots}}}$

- (a) -4 (b) 5 (c) 4 ☒ (d) 3

13. Find the square root of 151321.

- (a) 364 (b) 349 (c) 398 ☒ (d) 389

14. The sides of a triangular plot are in the ratio 3 : 5 : 7 and its perimeter is 300 m. What will be the area?

- (a) $500\sqrt{3} \text{ m}^2$ (b) $1500\sqrt{3} \text{ m}^2$ (c) $2000\sqrt{3} \text{ m}^2$ (d) $1200\sqrt{3} \text{ m}^2$

15. The median of the following data is 63, find the value of x.

29, 32, 48, 50, x, x+2, 72, 78, 84, 95

- (a) 63 (b) 62 (c) 61 (d) 60

16. Find the mode of 14, 25, 14, 18, 28, 17, 18, 14, 23, 22, 14, 18.

- (a) 15 (b) 14 (c) 16 (d) 18

17. In a cricket match, a batsman hits a boundary 6 times out of 30 balls he plays. What is the probability that he did not hit a boundary?

- (a) $\frac{4}{5}$ (b) $\frac{1}{5}$ (c) $\frac{3}{5}$ (d) 1

18. The following numbers of goals were scored by a team in a series of 10 matches :

2, 3, 4, 5, 0, 1, 3, 3, 4, 3

Find the mean of the scores.

- (a) 3 (b) 2.8 (c) 2.6 (d) 2.9

19. Find the LCM of 0.06, 9.60 and 0.12.

- (a) 9.60 (b) 0.12 (c) 0.60 (d) none of these

20. The distance of the point P(4,3) from the origin is -

- (a) 4 (b) 3 (c) 5 (d) 7

21. The area of the triangle formed by the points A(2,0), B(6,0) and C(4,6) is -

- (a) 24 sq. units (b) 12 sq. units (c) 10 sq. units (d) none

22. Find the sum of $(1 + 0.6 + 0.06 + 0.006 + 0.0006 + \dots)$.

- (a) $1\frac{1}{3}$ (b) $2\frac{1}{3}$ (c) $1\frac{2}{3}$ (d) $2\frac{2}{3}$

23. If $1^2 + 2^2 + 3^2 + \dots + x^2 = \frac{x(x+1)(2x+1)}{6}$, then $1^2 + 2^2 + 3^2 + \dots + 19^2$ is equal to

- (a) 1330 (b) 2100 (c) 2485 (d) 2470

24. If $1^3 + 2^3 + 3^3 + \dots + 10^3 = 3025$, then $4 + 32 + 108 + \dots + 4000$ is equal to

- (a) 12000 (b) 12100 (c) 122000 (d) 12400

25. If $a^2 + b^2 = 234$ and $ab = 108$, then find the value of $\frac{a+b}{a-b}$.

- (a) 10 (b) 8 (c) 5 (d) 4

26. The ages of Vaibhav and Jagat are in the ratio 12 : 7. After 6 yr, the ratio of their ages will be 3 : 2. What is the difference in their ages?

- (a) 8 yr (b) 12 yr (c) 9 yr (d) 10 yr

27. The abscissa of a point is positive in the

- (a) first and second quadrant (b) second and third quadrant (c) third and fourth quadrant (d) fourth and first quadrant.

28. The straight line passing through (-2,8) and (5,7)

- (a) cut the y-axis only (b) cut the both axes (c) not intersect any axis (d) cut the x-axis only.

29. x-intercept of the graph of $7x - 3y = 2$ is

- (a) $\frac{2}{5}$ (b) $\frac{2}{7}$ (c) $\frac{3}{4}$ (d) $\frac{3}{7}$

30. If $x + \frac{1}{x} = 4$ then the value of $x^3 + \frac{1}{x^3}$ is

- (a) 52 (b) 64 (c) 68 (d) 76

31. If $a + b + c = 0$, then $a^3 + b^3 + c^3$ is

- (a) $2abc$ (b) $3abc$ (c) abc (d) 0

32. If $x + \frac{1}{x} = 4$, then $(x^4 + \frac{1}{x^4})$ is equal to

- (a) 190 (b) 180 (c) 193 (d) 194

33. $3x^2 - 7x + 4 \leq 0$ implies

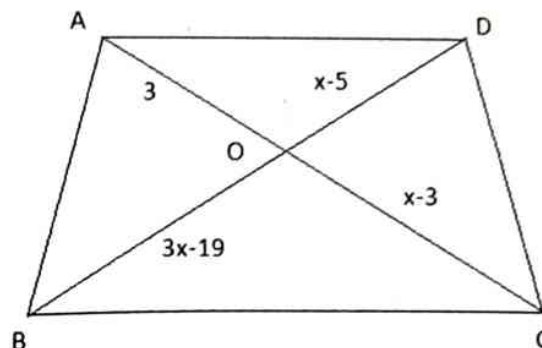
- (a) $x > 0$ (b) $x < 0$ (c) all x are zero (d) none

34. If ABCD is a rectangle, E, F are the mid-points of BC and AD respectively and G is any point on EF, then what is the area of ΔGAB ?

- (a) $\frac{1}{4}$ area of rectangle DFEC (b) $\frac{1}{2}$ area of rectangle FAGE (c) $\frac{1}{4}$ area of rectangle ABCD
(d) $\frac{1}{3}$ area of rectangle ABCD

35. In the given figure $AD \parallel BC$, find the values of x .

- (a) 6, 5 (b) 7, 8 (c) 8, 9 (d) 4, 5



36. Harsha is 40 yr old and Rajeev is 60 yr old. How many years ago the ratio of their ages was 3 : 5?

- (a) 10 (b) 20 (c) 37 (d) 5

37. Which one of the following is not a measure of central value?

- (a) Mean (b) Range (c) Median (d) Mode

38. The empirical relation between mean, mode and median is -

- (a) $\text{Mode} = 3 \text{ Median} - 2 \text{ Mean}$ (b) $\text{Mode} = 2 \text{ Median} - 3 \text{ Mean}$ (c) $\text{Median} = 3 \text{ Mode} - 2 \text{ Mean}$
(d) $\text{Mean} = 3 \text{ Median} - 2 \text{ Mode}$

39. Which of the following cannot be the probability of an event?

- (a) $\frac{1}{3}$ (b) $\frac{3}{5}$ (c) $\frac{5}{3}$ (d) 1

40. If two coins are tossed simultaneously, what is the probability of getting at least one head?

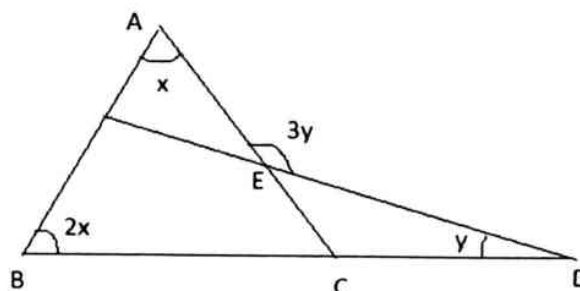
- (a) 1 (b) $\frac{2}{3}$ (c) $\frac{1}{2}$ (d) $\frac{3}{4}$

41. If two acute angles of a right triangle are equal, then each acute angle is equal to

- (a) 30° (b) 45° (c) 60° (d) 90°

42. What is y in term of x ?

- (a) x (b) $\frac{3}{4}x$ (c) $\frac{4}{3}x$ (d) $\frac{3}{2}x$



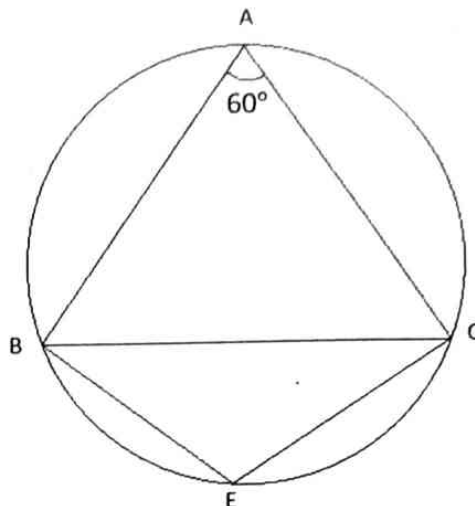
43. Which of the following is an irrational number?

- (a) $\sqrt{\frac{9}{27}}$ (b) $-\sqrt{64}$ (c) $\sqrt{1.44}$ (d) $\sqrt{\frac{1}{4}}$

44. The equation $x-3=0$ on the number line is represented by

- (a) a line (b) a point (c) infinitely many lines (d) two lines

45. ABCD is a trapezium in which $AB \parallel DC$. If $\text{area}(\triangle ABD) = 24 \text{ cm}^2$ and $AB = 8 \text{ cm}$, then height of $\triangle ABC$ is
 (a) 3 cm (b) 4 cm ☒ (c) 6 cm (d) 8 cm
46. $\triangle ABC$ is an equilateral triangle. Find $\angle BEC$
 (a) 60° (b) 90° ☒ (c) 120° (d) 180°



47. The surface area of a cuboid is 1300 cm^2 . If its breadth is 10cm and height is 20cm, find its length.
 (a) 12cm (b) 18cm (c) 20cm ☒ (d) 15cm
48. Two circular cylinders of equal volume have their height in the ratio 1 : 2. Ratio of their radius is –
 (a) $1 : \sqrt{2}$ ☒ (b) $\sqrt{2} : 1$ (c) 1 : 2 (d) 1 : 4
49. The total surface area of a cone of radius $\frac{r}{2}$ and length $2l$ is –
 (a) $2\pi r(l + r)$ ☒ (b) $\pi r(l + \frac{r}{4})$ (c) $\pi r(l + r)$ (d) $2\pi rl$
50. The value of k for which $(x - 1)$ is a factor of $4x^3 + 3x^2 - 4x + k$ is –
 (a) 3 (b) 1 (c) -2 ☒ (d) -3