GLOBAL MATH OLYMPIAD

Past Papers Archive

Compiled from GMO past editions — Seed through Scholar Level

www.mindcarver.com | info@mindcarver.com | +92 313 4506115

MIND CARVER

GLOBAL MATH OLYMPIAD — PAST PAPERS ARCHIVE

Pioneer Level

Grades 7–8

Past Paper — For Reference & Practice

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1 Basic problems (1 Each - 15 Marks)

1. Which of the following is not a rational number?

   (a) $\frac{5}{7}$
   (b) 0.25
   (c) $\sqrt{2}$
   (d) -2

2. The ratio of boys to girls in a class is 2:3. If there are 10 boys, how many girls are there?

   (a) 10
   (b) 12
   (c) 15
   (d) 20

3. If 20% of a number is 50, what is the number?

   (a) 200
   (b) 250
   (c) 300
   (d) 150

4. A right triangle has one angle of 90° and another angle of 45°. What is the third angle?

   (a) 60 degrees
   (b) 45 degrees
   (c) 15 degrees
   (d) 30 degrees

5. Which quadrilateral has both pairs of opposite sides parallel and equal in length?

   (a) Trapezoid
   (b) Rhombus
   (c) Parallelogram
   (d) Kite

6. A triangle with two equal sides is called:

   (a) Scalene
   (b) Equilateral
   (c) Isosceles
   (d) Right

7. Solve for $x : 2x - 3 = 11$

   (a) 5
   (b) 6
   (c) 8
   (d) 7

8. If $y = 3x$, what is y when $x = 5$?

   (a) 8
   (b) $15x$
   (c) 15
   (d) 2

9. Simplify $4(2x - 3)$

   (a) $8x + 3$
   (b) $8x + 12$
   (c) $8x - 12$
   (d) $8x + 4$

10. If all Bloops are Razzies and all Razzies are Lazzies, which of the following must be true?

    (a) All Bloops are Lazzies
    (b) All Lazzies are Bloops
    (c) All Razzies are Bloops
    (d) Some Lazzies are Bloops

11. A fair six-sided die is rolled. What is the probability of rolling an even number?

(a) $\frac{1}{6}$
(b) $\frac{2}{3}$
(c) $\frac{1}{2}$
(d) $\frac{4}{6}$

12. Ali is given two paths to his school: one is 5 km long, and the other is 6 km but has a shortcut reducing the distance by 1 km. Which path should he take for the shortest route?

(a) 5 km path
(b) 6 km path
(c) both are same
(d) not enough information

13. What is the mean of the numbers 4, 6, 8, 10, and 12?

(a) 6
(b) 8
(c) 7
(d) 9

14. The bar graph shows the number of books read by 4 students in a month. If the tallest bar represents 10 books, how many books did the student with the most books read?

(a) 10
(b) 40
(c) 20
(d) 50

15. What is the mode of the numbers 3, 5, 7, 3, 8, 5, 3, 6?

(a) 3
(b) 5
(c) 6
(d) 7

2 Moderate problems (3 Each - 45 Marks)

16. Which of the following is the result of multiplying a rational number by its reciprocal?

(a) 0
(b) 1
(c) same rational number
(d) different rational number

17. A store increases the price of a $50Rs$ item by 20%, then decreases it by 20%. What is the final price?

(a) 40 Rs
(b) 48 Rs
(c) 50 Rs
(d) 52 Rs

18. The angles in a triangle are in the ratio 3:4:5. What is the measure of the smallest angle?

(a) 30 degrees
(b) 45 degrees
(c) 60 degrees
(d) 15 degrees

19. A triangular traffic sign has a base of 60 cm and a height of 50 cm. What is its area?

(a) 300 cm^2
(b) 3000 cm^2
(c) 1500 cm^2
(d) 700 cm^2

20. In a right-angled triangle, the lengths of the two shorter sides are 6 cm and 8 cm. What is the length of the hypotenuse?

(a) 5 cm
(b) 10 cm
(c) 7 cm
(d) 100 cm

21. How many edges does a triangular prism have?

(a) 5 (b) 6 (c) 8 (d) 9

22. Which equation represents "a number is tripled and then increased by 5 to get 20"?

(a) $x^3 + 5 = 20$
(b) $3(x + 5) = 20$
(c) $3x + 5 = 20$
(d) $3x + 15 = 60$

23. Solve for $x : 5x - 7 = 3x + 9$

(a) 8 (b) 10 (c) 12 (d) 14

24. If $2m + 3 = 11$, what is the value of $3m - 2$?

(a) 7 (b) 8 (c) 10 (d) 13

25. A pizza is divided into 8 equal slices. If 3 slices are eaten, what fraction of the pizza remains?

(a) $\frac{3}{5}$
(b) $\frac{5}{3}$
(c) $\frac{3}{8}$
(d) $\frac{5}{8}$

26. Which number comes next in the pattern 2, 4, 8, 16 ?

(a) 20 (b) 24 (c) 32 (d) 64

27. A store sells one chocolate for $5Rs$, but you get one free for every three chocolates bought. If Sara buys 9 chocolates, how many total chocolates does she receive?

(a) 10 (b) 12 (c) 15 (d) 18

28. A pie chart shows the distribution of favorite fruits among students: 30% apples, 25% bananas, 20% oranges, and 25% grapes. If 200 students were surveyed, how many chose bananas?

(a) 30 (b) 50 (c) 60 (d) 80

29. A data set has a mean of 15 and a median of 12. If a new data point 20 is added, what happens to the mean and median?

(a) Mean increases, median stays the same
(b) Mean increases, median increases
(c) Mean stays the same, median increases
(d) Mean decreases, median stays the same

30. The scores of 6 students in a quiz are: 5, 8, 10, 12, 15, 20. What is the mean score?

(a) 8 (b) 10 (c) 12 (d) 11.6

3 Advanced problems (4 Each - 40 Marks)

31. What is the value of $(1\frac{1}{2} + 2.5) \div \frac{3}{4}$?

(a) 4 (b) $5\frac{1}{3}$ (c) 6 (d) $16\frac{2}{3}$

32. In a mixture of 60 liters, the ratio of milk and water is 2:1. If this ratio is to be 1:2, then the quantity of water to be further added is:

(a) 20 (b) 30 (c) 40 (d) 60

33. A sports league has 12 teams. Each team plays every other team once. How many total games will be played in the league?

(a) 36 (b) 66 (c) 144 (d) 132

34. A cone has a radius of 4 cm and a height of 9 cm. What is its volume (assuming $\pi = 3$)?

(a) 100 cm^3 (b) 120 cm^3 (c) 144 cm^3 (d) 156 cm^3

35. A trapezoidal field has two parallel sides of lengths 10 meters and 15 meters, and the distance between them is 8 meters. What is its area?

(a) 60 m^2 (b) 80 m^2 (c) 100 m^2 (d) 120 m^2

36. A square has it's length $(x + 5)$. Write the expression for its area.

(a) $x^2 + 10x + 25$
(b) $2(x + 5)$
(c) $x^2 - 10x + 25$
(d) Not enough information provided

37. The sum of three consecutive even integers is 78. What is the smallest of the three integers?

(a) 24 (b) 26 (c) 28 (d) 30

38. You have three doors in a game show. Behind one door is a car, behind the other two are goats. You pick a door, and the host (who knows where the car is) opens a different door, revealing a goat. Should you switch your choice?

(a) Yes, it increases your chance to win
(b) No, it decreases your chance
(c) It doesn't matter
(d) It depends on the host

39. A survey showed that 70% of students like math, 60% like science, and 40% like both math and science. What percentage of students like neither math nor science?

(a) 20% (b) 30% (c) 40% (d) 10%

40. In a class, the mean height of 10 students is 140 cm. If one new student joins with a height of 160 cm, what is the new mean? Round off to closest answer

(a) 144 cm (b) 143 cm (c) 141 cm (d) 145 cm