

Markhor Junior Contest 2019

Aspirant Level (Class IX & X, O/A Level's)

Mathematics

Time Allowed 60 Minutes

There are 19 problems, graded as follows:

Questions 1-5 are 1 point each,

Questions 6-10 are 2 points each,

Questions 11-15 are 3 points each,

Questions 16-19 are 5 points each.

1. Solve $\sqrt{41 - \sqrt{21 + \sqrt{19 - 9}}}$
 - a) 3
 - b) 4
 - c) 6
 - d) 9
2. 12 men can repair a road in 25 days, how long will 30 men take to do so?
 - a) 12 days
 - b) 8 days
 - c) 10 days
 - d) 9 days
3. If an inlet fills up a cistern in n hours, then in 1 hour it will fill
 - a) cistern
 - b) 1 cistern
 - c) $1/n$ cistern
 - d) None

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4. **A, B, and C can complete $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{5}$ of a project in a day, respectively. A works alone for 2 days, then B and C join. How many more days will they take to complete the project?**
- a) 2 days 8 hours
 - b) 2 days 12 hours
 - c) 3 days 4 hours
 - d) 3 days 8 hours
5. **A polyhedron has 12 vertices and 30 edges. How many faces does the polyhedron have?**
- a) 18
 - b) 20
 - c) 22
 - d) 24
6. **A hexagonal pyramid has a base with side length 6 cm and slant height 10 cm. What is its lateral surface area?**
- a) 180 cm^2
 - b) 240 cm^2
 - c) 270 cm^2
 - d) 300 cm^2
7. **A point $(-2, 5)$ is rotated 270° clockwise about the origin. Find the new coordinates.**
- a) $(5, 2)$
 - b) $(-5, 2)$
 - c) $(5, -2)$
 - d) $(-5, -2)$

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8. What is the order of rotational symmetry of a regular octagon?

- a) 6
- b) 8**
- c) 10
- d) 12

9. A feasible region is:

- a) A set of optimal solutions
- b) A set of all possible solutions**
- c) A set of constraint equations
- d) A set of objective functions

10. In a school with 180 students, it is known that:

- **q students participate in both music and drama clubs.**
- **Four times the number of students in both clubs participate only in the music club.**
- **Twice the number of students in both clubs participate only in the drama club.**
- **30 students do not participate in either club.**

How many students participate in both the music and drama clubs?

- a) 10
- b) 15**
- c) 20
- d) 25

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11. Let $P=13579246Y$ be an 8-digit number, where Y is a single unknown digit. If P is divisible by 9, which of the following statements is true?
- a) Y must be a multiple of 3.
 - b) Y must be multiple of 9.
 - c) Sum of first and last digit must be 9.
 - d) $Y=9x+8$ and x is a positive number.
12. Emily buys strawberries and blueberries, spending a total of Rs. 45. If each strawberry costs Rs. 5 and each blueberry costs Rs. 3, how many strawberries and blueberries did she purchase?
- a) 5 strawberries and 5 blueberries
 - b) 6 strawberries and 5 blueberries
 - c) 3 strawberries and 8 blueberries
 - d) 4 strawberries and 7 blueberries
13. In a multiple-choice test, each correct answer awards 2 points, while each incorrect answer deducts 1 point from the total score. The test consists of 50 questions, and a candidate scored exactly 1 point. How many questions did they answer correctly?
- a) 15
 - b) 17
 - c) 18
 - d) 19

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- 14. In the Markhor Junior Contest, some students from a school participated. Among them, 20% of the boys and 15% of the girls did not win the contest. The number of boys who won was 70 more than the number of girls who won. A total of 90 students did not win the contest. How many students appeared for the contest?**
- a) 450
 - b) 460
 - c) 480
 - d) 500
- 15. What is the smallest positive integer that, when multiplied by 4050, results in a perfect square? Also, find the square root of this resulting perfect square.**
- a) 2
 - b) 3
 - c) 4
 - d) 5
- 16. The sum of three consecutive multiples of 7 is 336. What is the largest of these numbers?**
- a) 107
 - b) 113
 - c) 119
 - d) 125

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- 17. Taha mistakenly multiplies a number by 3 instead of dividing it by 3. What percentage difference does this result in compared to the correct value?**
- a) 300%
 - b) 500%
 - c) 800%
 - d) 900%
- 18. In a recent examination, the failure rates for individual subjects were as follows: 41% in Economics, 35% in Geography, and 39% in History. Furthermore, 5% of students failed all three subjects, while 14% failed both Economics and Geography, 21% failed both Geography and History, and 18% failed both History and Economics. Determine the percentage of students who failed Economics exclusively, without failing any other subject."**
- a) 10%
 - b) 12%
 - c) 14%
 - d) 20%
- 19. Find the number of solutions for $|\sin x| = |\cos x|$ where x belongs to the interval $[-3\pi, 3\pi]$.**
- a) 6
 - b) 9
 - c) 12
 - d) 15