

Markhor Junior Contest 2024

Pioneer Level (Class VII & VIII)
Mathematics Time Allowed 60 Minutes

There are 19 problems, graded as follows:

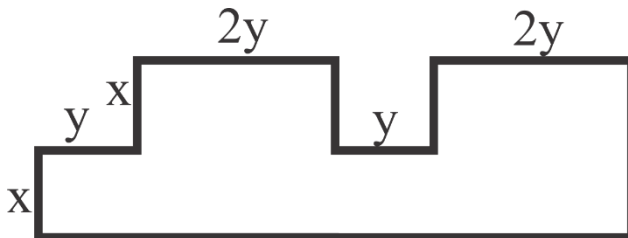
Questions 1-5 are 1 point each,

Questions 6-10 are 2 points each,

Questions 11-15 are 3 points each,

Questions 16-19 are 5 points each.

1. A six-digit number has a sum of its digits equal to 5. What can we determine about its product?
 - a) The product is even.
 - b) The product is a multiple of 3.
 - c) The product is zero.
 - d) The exact value of the product cannot be determined.
2. Find the perimeter.



- a) $2x+6y$
- b) $6x+6y$
- c) $7x+6y$
- d) $6x+12y$

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3. In this puzzle each shape has a specific value. The number next to each row or column represents the sum of the values in that row or column. What number should replace the question mark?

- a) 14
- b) 17
- c) 20
- d) 23

			?
			19
			14
15	13	19	

4. We have seven consecutive whole numbers in a row. If the sum of the first three numbers is 45, what is the sum of the last four numbers?
- a) 64
 - b) 87
 - c) 74
 - d) 47
5. The Markhor Junior Contest is held annually on the fourth Wednesday of August. What is the earliest possible date that the competition can take place?
- a) 15 August
 - b) 21 August
 - c) 22 August
 - d) 28 August

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- 6. A librarian places a series of books on a shelf, and then asks her assistants to insert a decorative bookmark between every two books. If the shelf now holds 29 items, how many books did the librarian originally place?**
- a) 14
 - b) 15
 - c) 20
 - d) 30
- 7. In a baking competition, Maya received points for 75% of all possible points. David scored even higher, getting an impressive 80% of the total points. Despite the higher percentage, David only earned 2 points more than Maya. What was the maximum possible score for this baking competition?**
- a) 50
 - b) 20
 - c) 40
 - d) 100
- 8. Choose the option that make the statement false. “A child counted the number of appearances of the letter T in this sentence and reported it correctly as _____.”**
- a) Ten
 - b) Eleven
 - c) Twelve
 - d) Thirteen

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- 9. What is the smallest positive integer that yields the same remainder when divided by 6, 7, 8, 9, and 12?**
- a) 2521
 - b) 2016
 - c) 1008
 - d) 504
- 10. Which of the following numbers does not have both a square root and a cube root that are integers?**
- a) 6^9
 - b) 5^{15}
 - c) 4^{13}
 - d) 2^{19}
- 11. A birthday party has a distinctive characteristic: no boys have the same day of the week as their birthday, and no girls share the same month as their birthdate. If a new guest joins the celebration, this special pattern will be broken. What is the current number of partygoers?**
- a) 19
 - b) 37
 - c) 38
 - d) 372

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- 12. Urooj flips a fair coin six times in a row. What's the probability that she gets more heads than tails?**
- a) $3/16$
 - b) $10/32$
 - c) $14/32$
 - d) $11/32$
- 13. When the numbers 308 and 400 are divided by the same positive integer, both leave same remainder. What is the value of this integer?**
- a) 9
 - b) 13
 - c) 17
 - d) 23
- 14. Three bakers - a cake maker, a pastry chef, and a bread baker - are preparing treats for a festival. They have a total of 100 pounds of flour to use in their recipes. Each baker uses an amount of flour that is a power of 2. How many pounds of flour does the baker with the smallest amount have?**
- a) 2
 - b) 4
 - c) 8
 - d) 1

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- 15. In a two-player game, the average score is 50% lower than Player A's score. What percentage increase does Player B's score need to reach the average score?**
- a) 20 %
 - b) 40%
 - c) 50%
 - d) 100%
- 16. In a collection of distinct positive integers, the following conditions apply:**
- Three of the integers have a remainder of 0 when divided by 3.
 - Fifteen of the integers have a remainder of 0 when divided by 11.
 - X is the maximum value in the collection.
- What is the smallest possible value of X?**
- a) 165
 - b) 187
 - c) 198
 - d) 33
- 17. A book club wants to share a stack of novels equally among their members. If one member cancels their attendance, each attendee gets two extra books. However, if two more members join the meeting, each attendee receives three fewer books. How many novels are in the stack?**

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- a) 180
- b) 200
- c) 220
- d) 250

18. A rectangle has sides measuring 8 cm and 14 cm. One of the 14 cm sides is chosen, and the angle bisectors at each end of this side are drawn. These bisectors intersect the opposite 14 cm side, dividing it into three segments.

What are the lengths of these segments?

- a) 4cm, 6cm, 4cm
- b) 6cm, 2cm, 6cm
- c) 8cm, 2cm, 8cm
- d) 3cm, 8cm, 3cm

19. The ages of three generations - grandfather, father, and son - have a product of 2024 and a sum of 70. Furthermore, the grandfather's age is 2 more than the product of the son's age and father's age. What is the grandfather's age?

- a) 70
- b) 44
- c) 46
- d) 22