

International Markhor Junior Contest 2023
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. Taha achieved 85% of the total points on a test, while Sara scored 90% on the same test. Remarkably, Sara's score exceeded Taha's by just one point. What is the highest possible number of points that could have been available on this test?**

 - a) 10
 - b) 15
 - c) 20
 - d) 30
- 2. Every year, Sarah collects as many seashells as her age in years during her beach vacations. She carefully preserves these seashells, and now she has 190 seashells. How old is she?**

 - a) 15
 - b) 20
 - c) 19
 - d) 10

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- 3. The age of the child's father and grandfather multiplied together equals 1770 in 2023. In which year was the grandfather born?**
- a. 1954
 - b. 1964
 - c. 1974
 - d. 1984
- 4. How many integers are there for which the sum of their digits equals 2023, and the product of their digits is 3?**
- a) 2020
 - b) 2021
 - c) 2022
 - d) 2023
- 5. What is the value of x if the sums of both rows are equal?**

11	12	13	14	15	16	17	18	19	X
5	10	15	20	25	30	35	40	45	50

- a) 140
- b) 20
- c) 135
- d) 275

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6. If $1+3+5+7+9=5\times 5$ then the given will be
 $1+3+5+7+9+11+13+15+17+19+21+23+25+27+29=$ __
a) 10×10
b) 20×20
c) 15×15
d) 25×25
7. If $a^x = \frac{1}{2}$ then a^{-5x}
a) 10
b) -10
c) 32
d) $\sqrt{2}$
8. The table initially contains 25 rows labelled from 1 to 25 and 25 columns labelled from 1 to 25. After removing rows that have odd numbers and columns that are multiples of 5, how many cells remain in the table?
a) 625
b) 260
c) 240
d) 200
9. If you have an 8-digit integer, and the sum of its digits is equal to 7, what can you say about the possible product of these digits?
a) 15
b) 0
c) 2
d) 10

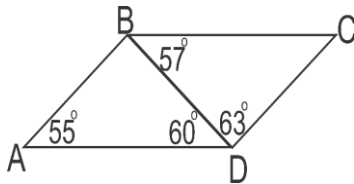
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10. A father is currently 22 years older than his son, who is 5 years old. How many years will the son's age be one-third of his father's?

- a) 15
- b) 6
- c) 3.5
- d) 10

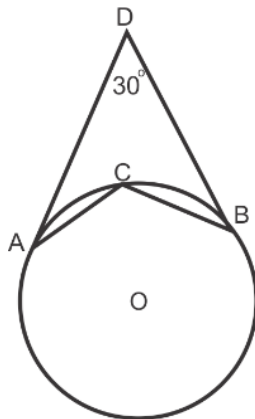
11. Among these line segments, which one is the most extended in length?

- a) AB
- b) CD
- c) AD
- d) BD



12. Points A and B lie on a circle centered at O, and point C resides on the smaller arc of the circle between A and B. The tangents to the circle at points A and B intersect at point D. Given that angle $\angle ADB = 30^\circ$ what is the measure of $\angle ACB$.

- a) 110
- b) 150
- c) 105
- d) 120



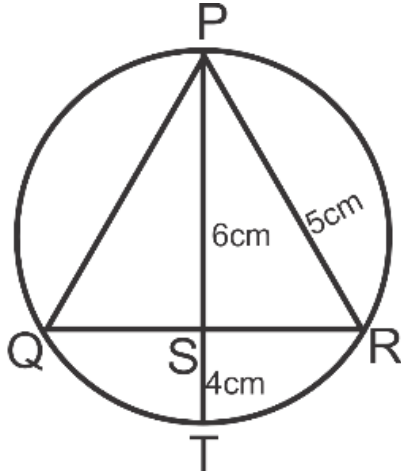
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13. In a sequence containing 120 numbers (1, 2, 2, 3, 3, 3, 4, 4, 4, 4, ...), where each number 'n' is repeated 'n' times, how many of these numbers are divisible by 3 or 5?

- a. 15
- b. 20
- c. 30
- d. 60

14. Inscribed within a circle is a triangle PQR. The angle bisector at point P intersects the line segment QR at S and intersects the circle at T. Given that PR measures 5 centimeters, PS measures 6 centimeters, and ST measures 4 centimeters, what is the length of segment PQ?

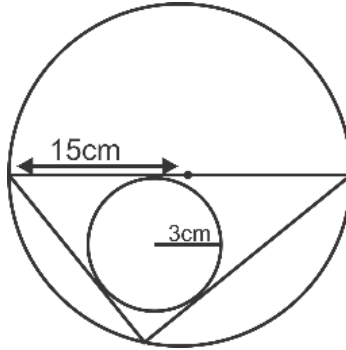
- a) 12
- b) 13
- c) 10
- d) 15



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15. With an inradius of 3 centimeters and a circumradius of 15 centimeters, what is the area of the right-angled triangle?

- a) 55 cm^2
- b) 45 cm^2
- c) 99 cm^2
- d) 90 cm^2



16. A car started from a point and traveled along a straight road at an initial speed of 40 km/h. Subsequently, every hour, another car also began its journey from the same point, with each car traveling 1 km/h faster than the one before it. The final car, which had a speed of 100 km/h, started its journey 60 hours after the first car. What was the speed of the car that was leading all the other cars 100 hours after the initial car departed from the initial point??

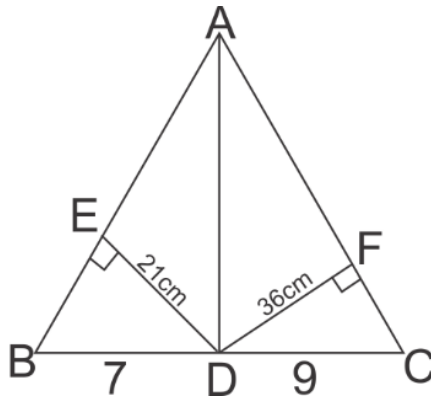
- a) 40km/h
- b) 60km/h
- c) 70km/h
- d) 100km/h

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17. In triangle ABC, point D lies on side BC such that the ratio of BD to DC is 7:9.

Perpendiculars are drawn from point D to sides AB and AC, creating points E and F, respectively. It is known that DE measures 21 cm and DF measures 36 cm. Can you determine the ratio of the lengths of sides AB and AC?

- a) 3:2
- b) 3:4
- c) 4:3
- d) 3:1



18. A can complete a particular task in 80 days. B is double as efficient as A, and C is 10% more productive than B. B managed to finish 40% of the task on their own. The remaining work was completed by A and C working together. How many days did it take to finish the entire task?

- a) 40
- b) 35
- c) 33
- d) 31

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19. Three numbers are in the ratio of $\frac{1}{3}, \frac{2}{5}$ and

$\frac{7}{10}$ respectively. The difference between the largest and smallest of these three numbers is 165. Can you determine the sum of these three numbers?

- a) 450
- b) 645
- c) 900
- d) 845