VIETNAM INTERNATIONAL APPLIED MATHEMATICS COMPETITION

MOCK TEST LEVEL 4

JUNIOR

(Grade 7 - 8)

I. MULTIPLE CHOICE QUESTIONS

Question 1. A duck farm starts with 20 ducks. Each month, the number of ducks increases by 5 due to breeding and additional purchases. Assuming the number of ducks increases steadily according to this pattern, how many ducks will the farm have by the 10th month?

A. 65 B. 75 C. 70 D. 80

Question 2. A wooden table manufacturing workshop has received a new order. Let x be the number of tables produced in a batch (unit: table). The fixed cost (rent, utilities, etc.) for each batch is 10 million VND; the production cost for each table is 1.2 million VND; and the selling price for each table is 2 million VND. Write a linear expression representing the profit (in million VND) of the workshop when x tables are sold.

A. $0.8x+10$ B. $3.2x-10$ C. $0.8x-10$ D. $3.2x+10$

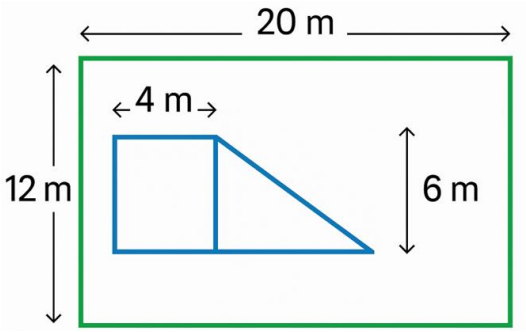
Question 3. Anna is trying to save money to buy a favorite toy set. Every week, Anna puts \$20 into her piggy bank. Currently, Anna already has \$150 in the piggy bank. Anna's mother promises to give Anna an additional \$15 each week as encouragement. Anna's goal is to have a total of \$500 to buy the favorite item. How many weeks will it take for her to reach her goal?

A. 5 B. 7 C. 10 D. 12

Question 4. A shop sells x notebooks at \$2 each and charges a \$1 shipping fee for the whole order. How much does the buyer need to pay in total

A. $2x+1$ B. $2x-1$ C. $x+2$ D. $x-2$

Question 5. A rectangular garden has a length of 20 meters and a width of 12 meters. In one corner of the garden, there is a rectangular fish pond measuring 6 meters by 4 meters. Next to it, there is a right triangle-shaped flower bed with legs of 6 meters each. The remaining area is paved. What is the area of the paved part of the garden?



A. 198 cm^2 B. 172 cm^2 C. 176 cm^2 D. 184 cm^2

Question 6. An only has 4 hours to schedule activities (each activity takes from 1.5 hours to 2 hours). How many activities can An do at most?

A. 2 B. 3 C. 1 D. 4

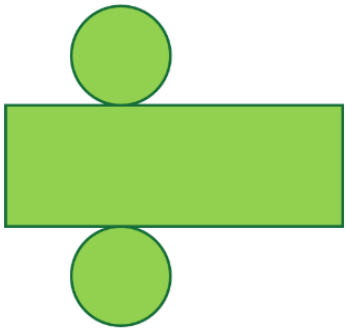
Question 7: The figure below is the net of which shape?

A. Cube

B. Cylinder

C. Rectangular prism

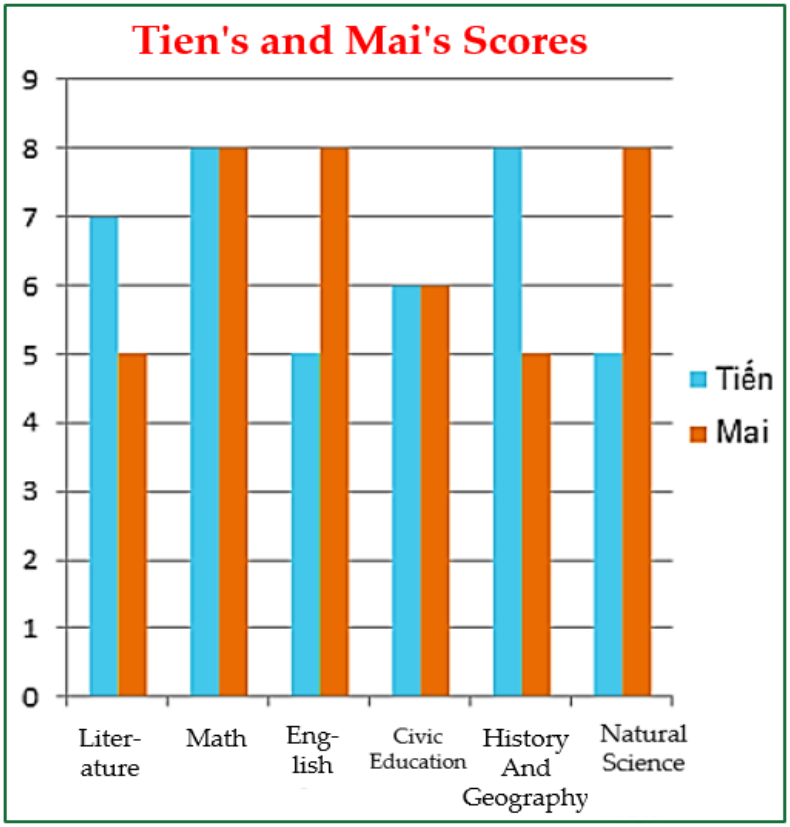
D. Truncated pyramid



Question 8. Lam is wearing a shirt with the number 2018 as shown in the picture. When he looks in the mirror, what number does he see on the shirt?

A. 5018 B. 8105 C. 8102 D. 2018

Question 9. Look at the chart and state which of the following assertions is correct:



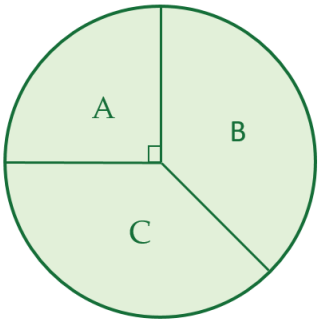
A. Tien's Literature score is higher than Mai's

B. Tien's Natural Science score is higher than Mai's

C. Tien's and Mai's History scores are equal.

D. Tien's Math score is lower than Mai's

Question 10. There are 3 individuals A, B, and C who contributed all the shares to a financial company, represented by the diagram below. What is the contribution ratio of A and B?



A. 62,5%. B. 75%. C. 25%. D. 50%.

Question 11. In a meeting, there are 5 people (A; B; C; D; E) and 5 chairs arranged in a row. How many seating arrangements are possible if A and B are not allowed to sit next to each other?

A. 48 B. 96 C. 24 D. 72

Question 12. Two standard six-sided dice are rolled simultaneously. What is the probability that the sum of the numbers on the two faces is exactly 7?

A. $\frac{5}{6}$ B. $\frac{2}{7}$ C. $\frac{7}{6}$ D. $\frac{1}{6}$

Question 13. In an interview, three friends An, Binh, and Cuong made the following statements:

- An said: "Binh is lying."
- Binh said: "Cuong is lying."
- Cuong said: "Both An and Binh are lying."

Knowing that only one person is telling the truth and the other two are lying, and the truthful person always speaks correctly while the liars always speak incorrectly. Who among the three friends is telling the truth?

A. An B. Bình

C. Cường D. No one

Question 14. There are 3 types of candies in a box: 5 red candies, 4 orange candies, 3 green candies. The candies are put into the box randomly, and their colors are not visible when picked out. How many candies must be picked at least to be sure to have at least 2 candies of different types (colors)?

A. 4 B. 5 C. 6 D. 7

Question 15. Nam took a test with 20 questions. Each correct answer earns 5 points, and each incorrect answer results in a deduction of 2 points. After completing the test, Nam scored a total of 58 points. How many questions did Nam answer correctly?

A. 12 B. 13 C. 14 D.15

II. SHORT ANSWER QUESTIONS

Question 16. Binh borrowed 50,000,000 VND from a bank to buy a bicycle, with an annual interest rate of 8%. Each month, Binh repays both the principal and the interest,

so that the remaining principal decreases after every month. The repayment period is 2 years (24 months). Question: After 2 years, what is the total amount of interest Binh has to pay?

Question 17. A toy factory has 2 machines: machine A produces 12 teddy bears/hour with a cost of 240,000 VND/hour, and machine B produces 8 cars/hour with a cost of 200,000 VND/hour. A production order requires:

- At least 60 teddy bears
- At least 40 cars
- Due to labor limitations, the total operating time of both machines must not exceed 10 hours.

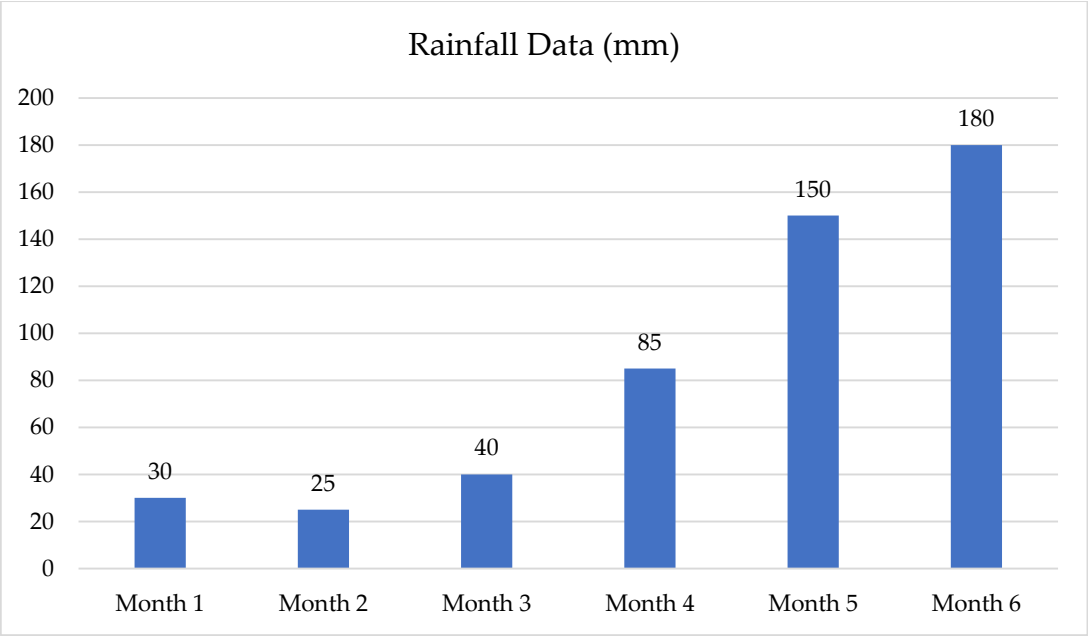
Find the operating time for each machine (x, y) to minimize the cost. Calculate that optimal cost.

Question 18. 30 grams of table salt (NaCl) are dissolved in 120 grams of distilled water. After thorough stirring, a portion of the solution evaporates, causing the total mass to decrease by 20%. Calculate the percentage concentration of the solution after evaporation.

Question 19. Flight VN202 departs from Hanoi (time zone GMT+7) at 9:30 AM on May 15th and arrives in Los Angeles (time zone GMT-7). The flight time is 14 hours 45 minutes, and the average speed of the return flight from Los Angeles to Hanoi, after stopping for 2 hours in Los Angeles, is 850km/h. If the speed decreases by 10% due to headwinds, what time will it arrive back in Hanoi?

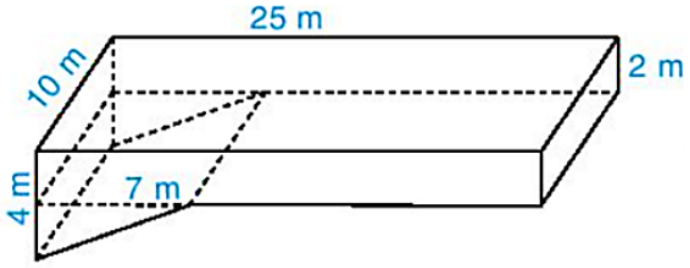
Câu 20. In pea plants, yellow seeds are a dominant trait, while green seeds are a recessive trait. When two yellow-seeded plants, each carrying both the yellow and green factors, are crossed, the offspring have an average ratio of 3 yellow seeds to 1 green seed. If 160 seeds are obtained, how many yellow seeds are expected?

Question 21. Nam is working on a climate project for his Science class. He has collected data on the average rainfall (mm) in Da Lat City during the first 6 months of 2025 as follows:

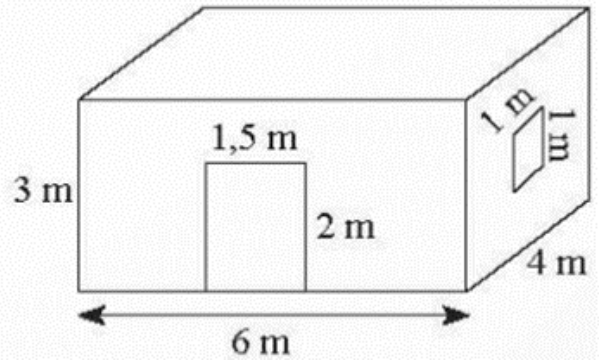


Calculate the average rainfall (mm) for this city in the first 6 months of 2025.

Question 22. A swimming pool has the shape and dimensions as shown in the figure below. The shape of the pool is a combination of a rectangular prism and a right triangular prism. If the pool is filled with water, how much water does it contain (neglecting the thickness of the pool walls)?



Question 23. Mr. Nam's room has a large rectangular door and a square window with the dimensions shown in the diagram. How much money will he need to paint the four interior walls of the room (excluding the door and window)? It is known that the cost of painting is 30,000 VND per square meter.



Question 24. A home plate in baseball has a triangular shape as modeled in (Figure 1). We want to place a lamp at point I to illuminate the entire home plate. After measuring and modeling the dimensions of the home plate as in (Figure 2). Set up an Oxy coordinate system (Figure 3) where the vertices of the home plate have coordinates A(0;3), B(4;0), and C(4;7) respectively. Where should point I be located (what are its coordinates) to ensure the entire home plate is illuminated?

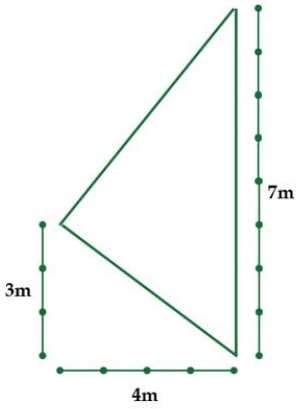


Figure 1

Figure 2

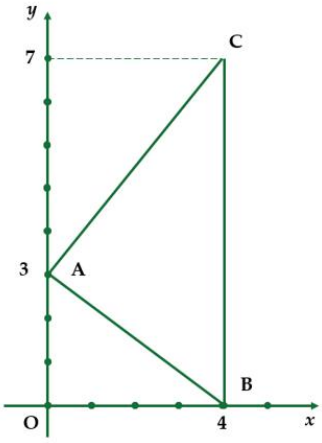


Figure 3

Question 25. Below is a Sudoku game with numbers 1∼6. The numbers in each row, column, or 3 x 2 frame cannot be repeated. Suppose three arrows are drawn, and the numbers from tail to head of the arrow must be in ascending order, where the number in each square is larger than the previous one by 1. Find the 5-digit number *ABCDE*.