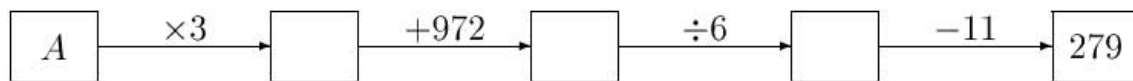
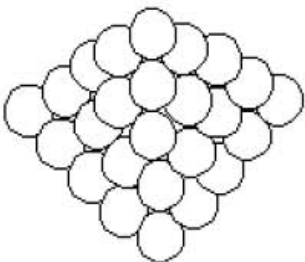


**INTERNATIONL MATHENATICS AND SCIENCE OLYMPIAD**  
**FOR PRIMARY SCHOOLS (IMSO) 2004**  
**Mathematics Contest in Taiwan**

**Short Answer**

1. Every 7 days, a newspaper man drops a weekly magazine at Amir's house. A milkman goes there every 6 days. Last October 1st, the two men went to Amir's house. When (date and month) will they go there again on the same day?
2. A bus can carry 30 passengers, a minibus 8 passengers, and a train car 52 passengers. At least how many train cars are needed to carry passengers from 6 full buses and 13 full minibuses?
3. What is the value of  $A$  to get the final result 279 as shown below?



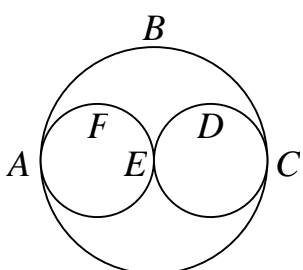
4. Machine  $A$  cost \$500 and machine  $B$  cost \$1000. We need \$10 per day to run machine  $A$ , and \$5 per day to run machine  $B$ . After running how many days will the total cost for both machines be equal?
5. Find a number greater than  $\frac{1}{5}$ , but less than  $\frac{1}{4}$ .
6. Find the number of positive integers smaller than 1000 such that the sum of the first digit and the last digit is 10.
7. How many integers between 999 and 2001 are divisible by 5.
8. What is the units digit of  $3^{200}$ ?
9. A watermelon of 1 kg contains 93% water. After being left under the sun for a while, its water content went down to 90%. What is the weight of the watermelon now?
10.  A fruit seller arranges her oranges to form a pyramid. At each level, the oranges form an equilateral triangle, except at the top level where there is only one orange. The orange pyramid has 10 levels. How many oranges are there altogether?
11. Find the smallest positive integer such that the product of 420 and this integer is equal to a square integer.
12. There are two numbers, namely 2003 and 3002. Fevi chose one of these and multiplied it by 4321. Adi chose the other number and multiplied it by 1234. The sum of the two products is even. Which number did Fevi choose?

13. Find the 7777777<sup>th</sup> digit after the decimal point of the decimal equivalent of  $\frac{1}{7}$ .

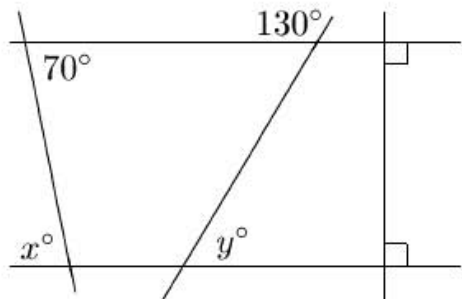
14. Essa and Wira bought a pen each. After paying, Essa's money is  $\frac{5}{6}$  of his original amount, while Wira's money is  $\frac{3}{5}$  of his original amount. What was the ratio of their money before they bought the pens?

15.  $\square\square \times \square\square\square$  Put each of the numbers 2, 3, 6, 8, and 9 in the boxes so that the product is the largest.

16. Use all digits 2, 3, 4, 5, 7, and 8 exactly once to get two numbers  $P$  and  $Q$ . Both  $P$  and  $Q$  contain three digits and that  $P - Q$  is positive. Find the smallest value of  $P - Q$ .

17.  In the figure, the diameter of the smaller circles equal to the radius of the larger circle. The area of the larger circle is  $\pi$  square units. What is the length of  $ABCDEF A$ ?

18. We have 40 unit cubes with side length 1 cm. Using all cubes we build a complete rectangular solid box. If the perimeter of its base is 14 cm long, what is the height of the box?

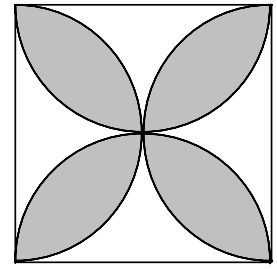
19.  What is  $x^\circ + y^\circ$ ?

20. The length of a rectangle is increased by 10%, while its width is increased by 20%. By how many percent is the area of the rectangle enlarged?

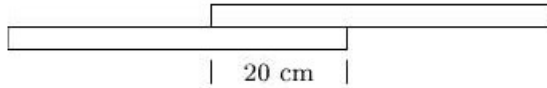
21. A worker is building a wall of length 6 meters and height 4 meters. There are two windows on the wall. Both windows are of the same size: 1.5 meters high and 1 meter wide. Each square meter of the wall needs 17 bricks. How many bricks are needed in total?

22. Popy walked at a speed of 3 km/hour and Qina at 4 km/hour. Starting from the same point, they walked around a circular park in opposite directions. They met again after 6 minutes. What is the approximate length of the diameter of the park, in meter?

23. In the figure we have a square of side length 14 cm. On each side we draw a semicircle of radius 7 cm with center at the midpoint of the side. Find the area of the shaded regions.



24.



Three sticks of length 1.5 m, 0.8 m, and 2.3 m are joined into one long pole. At each joint, part of two sticks of length 20 cm each are bound with ropes. What is the length of the long pole?

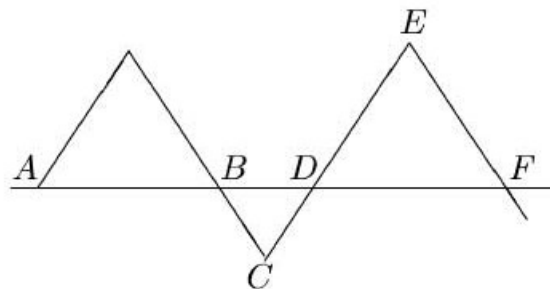
25. Mark started his trip from city  $A$ . He went east for 15 km, then went north for 3 km. After that he went west for 9 km. Finally, he went north for 5 km to end his trip at city  $B$ . What is the shortest distance from city  $A$  to city  $B$ ?
26. Andi, Baba, and Ciko run at a speed of 5, 6, and 7 km/hour, respectively. They started from the same point at 6 : 00, 6 : 30, and 7 : 00 in the morning, respectively. They went through the same path. When he passed Andi, Baba gave him a message for Ciko. At what time will Ciko receive the message?

27.



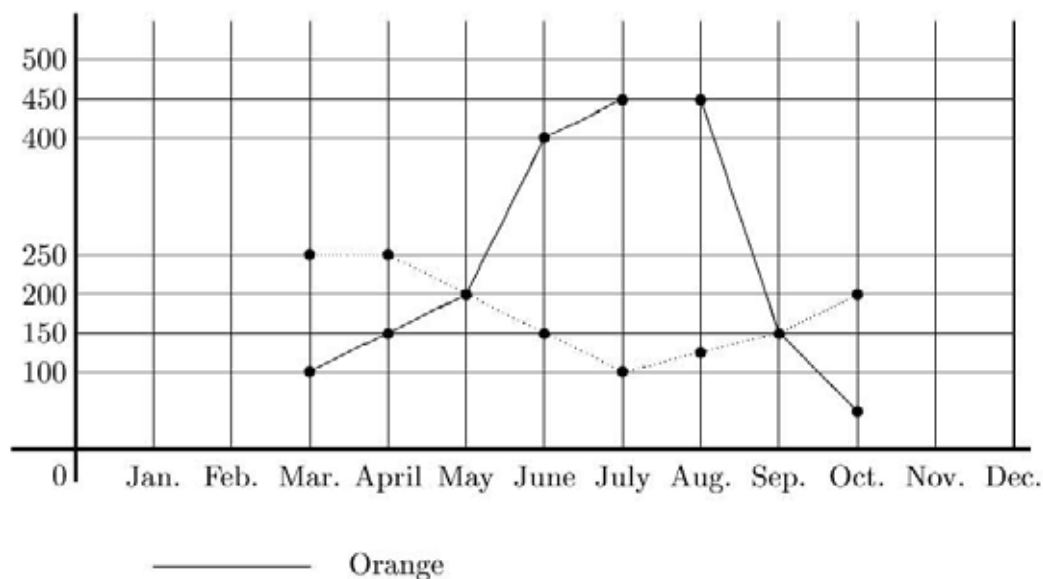
A rectangular corn field is 15 meters long and 10 meters wide. Corn plants are grown in rows and columns (see figure). Each corn plant is 50 cm from the nearest corn plants in the same row or column. Corn plants near the boundary are 50 cm from the fence. How many corn plants are there in that field?

28. If  $DE = DF$ ,  $\angle ABC = 100^\circ$ , and  $\angle DEF = 70^\circ$ , what is the measure of  $\angle BCD$ ?

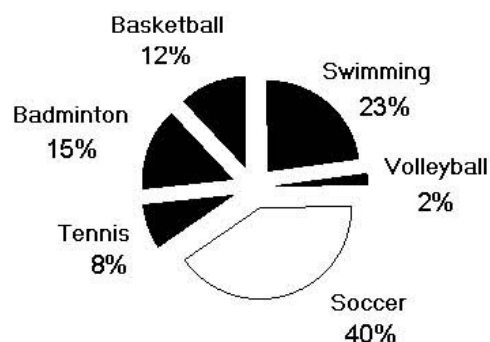


29. The average score of a mathematics exam in a class is 5.2. One student, who scored 7 in the exam, moved to another school. The average score of the remaining students is 5. How many students were there before the student moved out?
30. Tina sells apples and oranges. The prices of apples is 8,000 rupiahs/kg and the prices of oranges is 5,000 rupiahs/kg. The following graph shows how many

kilogram apples and oranges Tina sold each month. In which month did she get the most money?



31. The following graph shows the percentage of students belonging to various sport clubs in a school. If the tennis club has 24 members, how many members does the swimming club have?



32. If wheel  $A$  is rotating in clockwise direction, in which direction will wheel  $B$  rotate?



2003 wheels

33. Andy always tell lies on Wednesdays, Thursdays and Fridays. Other days than those three, Andy is always honest. On the other hand, Fred is always lying on Saturdays, Sundays and Mondays. But, Fred is always honest on the rest of the week. One day, both of them said: "I lied yesterday". On what day did they say that?
34. An explorer is making a map of the North Pole. She puts a marker  $A$  exactly at the pole and a marker  $B$  at 5 km south of the marker  $A$ . Then she puts a marker  $C$  at 5 km east of the marker  $B$ . Finally, she puts a marker  $D$  at 4 km north of the marker  $C$ . How far apart are the markers  $A$  and  $D$ ?
35. Seven friends met at a party. Each of them shook hands with everyone else in the party exactly once. How many handshakes happened?