INTERNATIONAL MATHEMATICS AND SCIENCE OLYMPIAD FOR PRIMARY SCHOOLS (IMSO) 2009

Mathematics Contest (Second Round) in Taiwan

Short Answer Problems

Name:_____ School:_____ Grade:_____ Number:_____

Short Answer: there are 20 questions, fill in the correct answers in the space provided after each question. Each correct answer is worth 2 points.
Time limit: 60 minutes.

1. Henry was given a certain number to multiply by 507, but he placed the first figure of his product by 5 below the second figure from the right instead of below the third. The result of Henry's mistake was that his answer was wrong by 382050. What was the multiplicand?

   ANS: _____

2. Mice have 4 legs, ants have 6 legs and spiders have 8 legs. Eddy has twice as many mice as spiders, and three times as many ants as spiders. The number of legs adds up to 68. How many spiders does he have?

   ANS: _____

3. There are 100 nuts in five bags. In the first and second bags, there are altogether 42 nuts; in the second and third bags, there are 43 nuts; in the third and fourth bags, there are 34 nuts; in the fourth and fifth bags, there are 30 nuts. How many nuts are there in the first bag?

   ANS: _____

4. A student had to multiply 169 by a two-digit number whose second digit is twice as big as the first digit. Accidentally he changed the places of the two digits and obtained a product that differed from the correct one by 4563. Find the two-digit number.

   ANS: _____

5. How many days is it from Wednesday the 1st August to the first Saturday in September? (Inclusive of both dates)

   ANS: _____

6. If 6 cats can catch 6 rats in 6 minutes, how many cats are needed to catch 12 rats in 12 minutes?

   ANS: _____

7. A collection of sheep and turkeys have a total of 99 heads and legs between them. There are twice as many turkeys as there are sheep. How many turkeys are there?

   ANS: _____

8. Find the smallest possible number that leaves a remainder of 1 when divided by 2, 3, 4, 5 or 6, and which can be divided by 7 exactly.

ANS: _____

9. Each of the letters *A*, *B*, *C*, *D*, *E* is used to represent a single digit in these two statements.(Same letter = same digit.) $A + B = C$, $C + D = \overline{EA}$ (Note $\overline{EA}$ is a 2-digit number) What is the value of $B + D$?

ANS: _____

10. Ann, Ben and Carol each have some money. If Ann gave Ben $30, then Ben would have twice as much as Ann. If Ben gave Carol $30, then Carol would have twice as much as Ben. If Carol gave Ann $30, then they would both have the same amount. How much money did Ann have?

ANS: $ _____

11. A square lawn has a path 1 m wide which goes around the outside of all the four edges. The area of the path is 40 m^2. What is the area of the lawn?

ANS: _____ m^2

12. Four consecutive odd numbers add up to a total of 80. What is the smallest of those four numbers.

ANS: _____

13. A cube with an edge length of 10 cm is resting on a horizontal table. An insect starts crawling from the table at an angle of 30 degrees to the horizontal. How far will it have crawled on the cube by the time it gets to the top?

ANS: _____ cm

14. On this diagram you may start at any square and move up or down or across (but NOT diagonally) into the next square. No square may be used twice. The digits in each square are written down in the order they are used to form a number. What is the largest number that can be made?

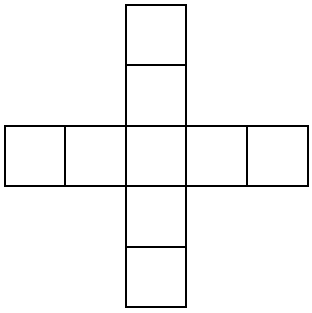
5	9	1
8	4	7
3	6	2

ANS: _____

15. A new monument is to be made in the shape of a cuboid. Only three of the faces are to be decorated. To allow for this: one face has to have an area of 48 m^2; another is to have an area of 72 m^2; and another of 96 m^2. What will be the volume of the monument?

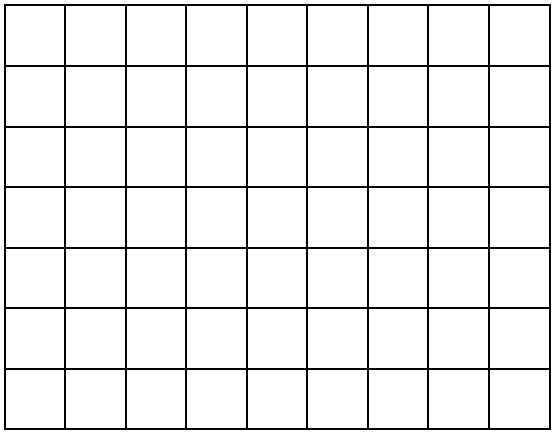
ANS: _____ m^3

16. Arrange the numbers 1 to 9, using each number only once and placing only one number in each cell so that the totals in both directions (vertically and horizontally) are the same. How many different sums are there?



ANS: _____

17. How many distinct squares (not necessarily different in size) can be traced out following only the lines of the grid drawn below?

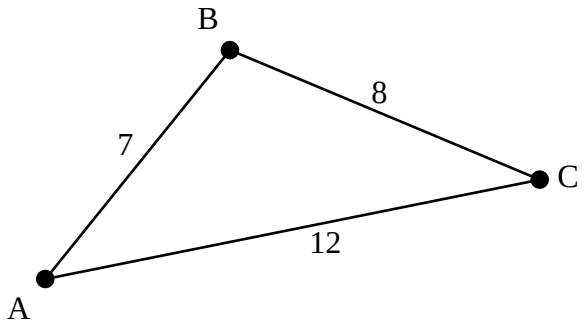


ANS: _____

18. A 4-wheeler car has travelled 24,000 km and, in that distance, has worn out 6 tyres. Each tyre travelled the same distance. How far did each separate tyre travel?

ANS: _____ km

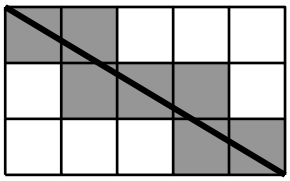
19. A, B and C are three villages near to each other, shown in the diagram below, where the straight lines represent the only roads joining the villages. The figures give the distances in km between villages.



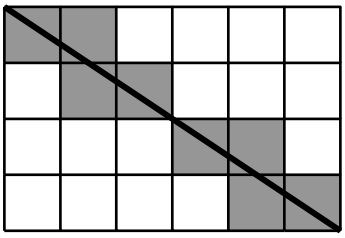
A new fire station is to be built to serve all three villages. It is to be on a roadside at such a position that the greatest distance that the fire-engine has to travel along the roads in an emergency at one of the villages is as small as it can be. What is this smallest distance?

ANS: _____ km

20. The diagonal of this 5×3 rectangle passes through 7 squares.



The diagonal of this 6×4 rectangle passes through 8 squares.



What is the number of squares passed through by the diagonal of a 360×2009 rectangle?

ANS: _____