India 2nd Elementary Mathematics International Contest

Team Contest

Date- 10th September 2004   Place – Lucknow, India

Team _____   Name _____Score _____

T1.   There are three people: grandfather, father and son. The grandfather's age is an even number. If you invert the order of the digits of the grandfather's age, you get the father's age. When adding the digits of the father's age together, you get the son's age. The sum of the three people's ages is 144. The grandfather's age is less than 100. How old is the grandfather?

Answer :   _____

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T2. Three cubes of volume 1 cm^3, 8 cm^3 and 27 cm^3 are glued together at their faces. Find the smallest possible surface area of the resulting configuration.

Answer :　　_____

T3.   A rectangle is 324 m in length and 141 m in width. Divide it into squares with sides of 141 m, and leave one rectangle with a side less than 141 m. Then divide this new rectangle into smaller squares with sides of the new rectangle's width, leaving a smaller rectangle as before. Repeat until all the figures are squares. What is the length of the side of the smallest square?

Answer :   _____

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T4. We have assigned different whole numbers to different letters and then multiplied their values together to make the values of words.   For example, if $F = 5$, $O = 3$ and $X = 2$, then $FOX = 30$.

Given that $TEEN = 52$, $TILT = 77$ and $TALL = 363$, what is the value of $TATTLE$?

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T5. If $A = 1 \times 2 + 2 \times 3 + 3 \times 4 + \ldots\ldots\ldots\ldots + 98 \times 99$ and

$B = 1^2 + 2^2 + 3^2 + \ldots\ldots\ldots\ldots\ldots + 97^2 + 98^2$,

what is the value of $A + B$?

Answer :   _____

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T6.   Nine chairs in a row are to be occupied by six students and Professors Alpha, Beta and Gamma. These three professors arrive before the six students and decide to choose their chairs so that each professor will be between two students. In how many ways can Professors Alpha, Beta and Gamma choose their chairs?

Answer :   _____

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T7.   Compute: $\dfrac{3}{1} + \dfrac{3}{1+2} + \dfrac{3}{1+2+3} + ... + \dfrac{3}{1+2+3+...+100}$

Answer :   _____

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T8.   How many different three–digit numbers can satisfy the following multiplication problem?

$$
\begin{array}{r}
\square\,\square\,\square \\
\times \quad 9\ \square \\
\hline
\square\ 2\ \square\,\square
\end{array}
$$

Answer : _____

T9. There are 16 containers of various shapes in the 4×4 array below. Each container has a capacity of 5 litres, but only contains the number of litres as shown in the diagram. The numbers on the sides indicate the total amount of water in the corresponding line of containers. Redistribute the water from only one container to make all the totals equal.
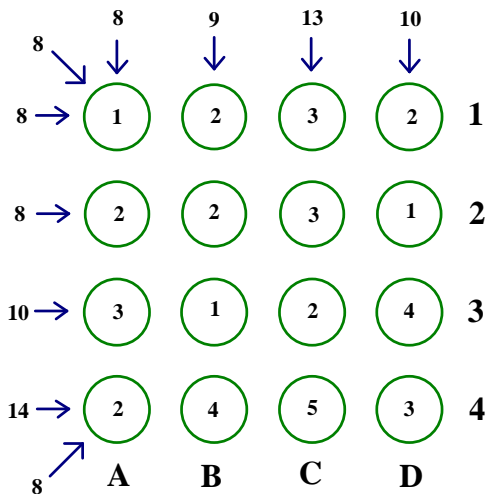
Show your answer by writing the new number of litres in each of the containers in the diagram below.
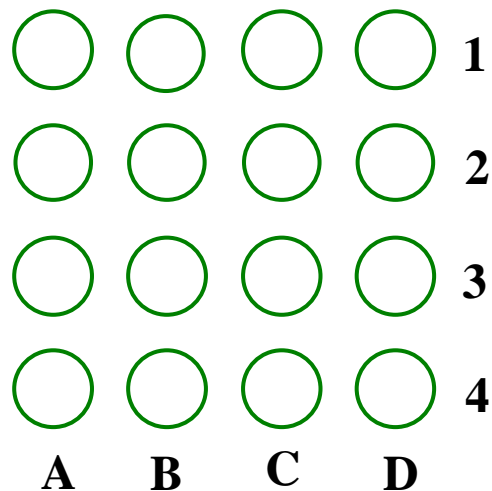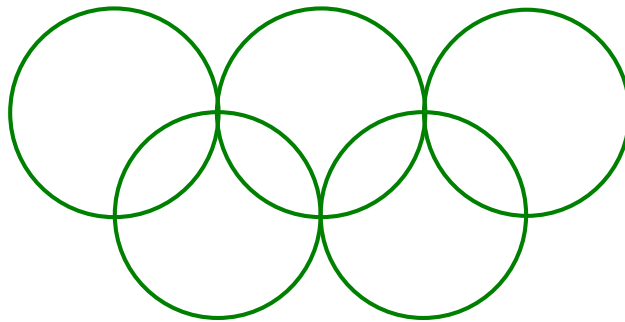
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T10. How many possible solutions are there in arranging the digits 1 to 9 into each closed area so that the sum of the digits inside every circle is the same. Each closed area contains only one digit and no digits are repeated. Draw all the possible solutions.

Answer: _____