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7th Primary Mathematics World Contest

Problems for Team Contest

T1. Candle A, one centimeter longer than Candle B, was lit at 5:30 pm and Candle B was lit at 7:00 pm. Each candle burns at a constant rate. At 9:30 pm, the two candles were of the smae length. Candle A burned out at 11:30 pm while Candle B burned out at 11:00 pm. How many cm was Candle A before it was lit?

T2. What is the time on a clock between 4 o'clock and 5 o'clock, if the minute hand and the hour hand are overlapping each other?

T3. What is the largest number of consecutive positive integers that add up too exactly 1000.

T4. How many different paths are there that begin with "M" and end with "S" to spell the word "MATHS" in this picture?

S
SHS
SHTHS
SHTATHS
SHTAMATHS
SHTATHS
SHTHS
SHS
S

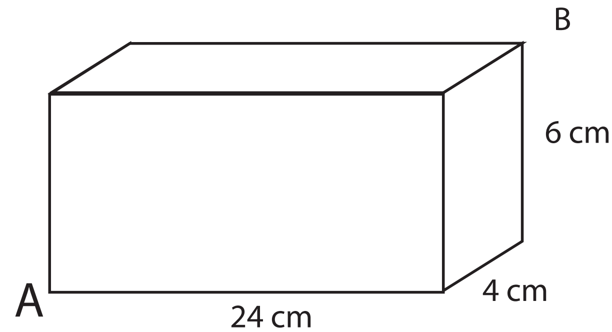
T5. Choose three different digits x,y,z from 1 to 9 to make a three-digit number $\overline{xyz}$.

What is the smallest value of $\dfrac{\overline{xyz}}{x+y+z}$?

T6. A right triangle has three sides of length *a, b* and *c*, where *c* is the longest side. Then you may assume the Pythagorean theorem which states that:

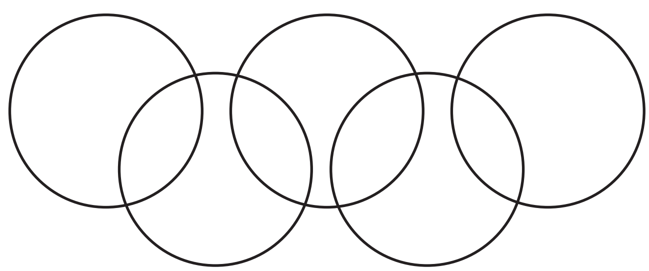
$$a^2 + b^2 = c^2$$

Now consider a rectangular box pictured to the right with sides of length 24 cm, 6 cm and 4 cm. An ant, standing at point A, wants to go on the surface of the rectangular box to point B (diagonally opposite corner of the box). If the ant walk at a rate of 2 cm/min from A to B, find the minimum time for the ant to complete the trip.



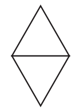
T7. In a mathematical Olympiad, 100 students were given four problems to solve. The first problem was solved by exactly 90 students, the second by exaclty 80 students, the third by exactly 70 students and the fourth by exactly 60. No participant solved all four problems. How many students solved both the third and fourth problems?

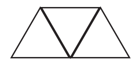
T8. In the diagram below, each of the nine regions is filled with a different non-zero digit, so that the sum of all digits in each circle is the same. What is the maximum value of the sum?

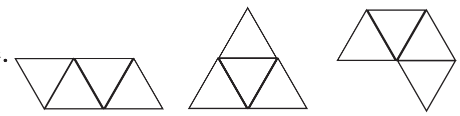


T9. How many integers are there from 0 to 2004 (inclusive) that contain at least one digit 2 but do not contain any digit 7?

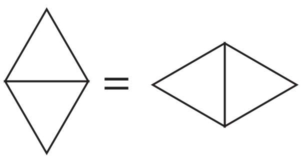
T10. From an unlimited number of identical equilateral triangle tiles, we can put some of the tiles together to form different shapes, always having full sides touch and the corners meet. Then we find that:

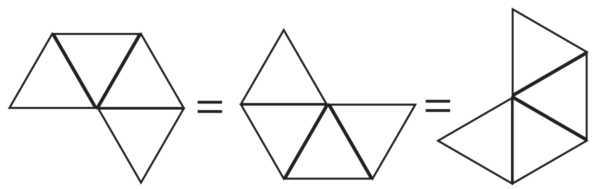
using exactly 2 tiles, we can form only 1 shape, i.e. 

using exactly 3 tiles, we can form only 1 shape, i.e. 

using exactly 4 tiles, we can from only 3 shapes, i.e. 

Shapes are considered the same if they can be formed by a sequences of translations, rotations and/or flips. For example





How many differen shapes can be formed when we use exactly 6 tiles?