



# Malaysia International Mathematics Olympiad Competition 2016 TEAM CONTEST (UP)

School (学校) : \_\_\_\_\_ Student ID (编号) : \_\_\_\_\_

Name (姓名) : \_\_\_\_\_

1. Calculate:  $1957 \times \left( \frac{1}{59} - \frac{1}{2016} \right) + 59 \times \left( \frac{1}{1957} - \frac{1}{2016} \right) - 2016 \times \left( \frac{1}{1957} + \frac{1}{59} \right) + 3 = ?$

计算:  $1957 \times \left( \frac{1}{59} - \frac{1}{2016} \right) + 59 \times \left( \frac{1}{1957} - \frac{1}{2016} \right) - 2016 \times \left( \frac{1}{1957} + \frac{1}{59} \right) + 3 = ?$

Answer : \_\_\_\_\_

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2. Choose two numbers from the known series of numbers: 1, 3, 5, 7, 9, 11, 13, ..., 87, 89 and 91, and then add up the rest numbers to make a sum of 2016. Thus what's the difference between the possible maximum and the possible minimum values of the products of the chosen two numbers?

从已知的一系列数：1、3、5、7、9、11、13、...、87、89、91 中，选出其中的两个数，然后将剩下的数相加，使其和为 2016，那么被选中的两个数的乘积可能的最大值与最小值的差是多少？

Answer : \_\_\_\_\_

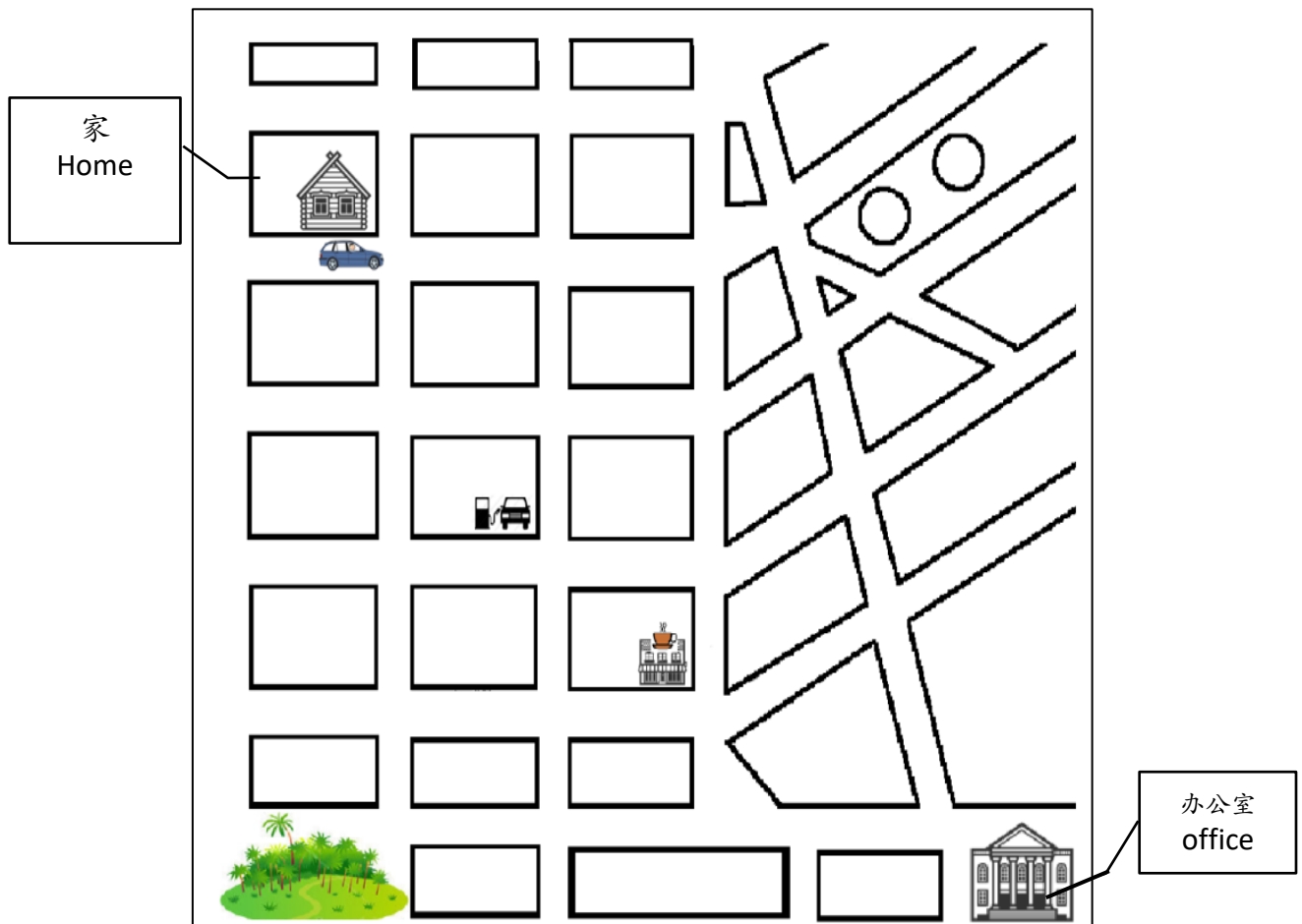
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3. Before father goes to work every morning, he always stops at the petrol station to refill the fuel tank, and buy a cup of hot coffee and sandwiches before he is heading to office. How many shortest routes for father to transit from home to his office based on the map below?

爸爸每天早上上班，总是先到加油站添油，然后再买一杯热腾腾的咖啡及三明治，才到办公室。下图是有关地图，请问爸爸每天早上可有多少条最短路线从家到达办公室？



Answer : \_\_\_\_\_

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4. The sides' lengths of a quadrilateral are 1cm, 5cm, 5cm and 7cm. Find the greatest area of this quadrilateral.

有一四边形的四条边长分别为 1cm, 5cm, 5cm 及 7cm. 那么它的最大面积可以是多少  $\text{cm}^2$  ?

Answer : \_\_\_\_\_  $\text{cm}^2$

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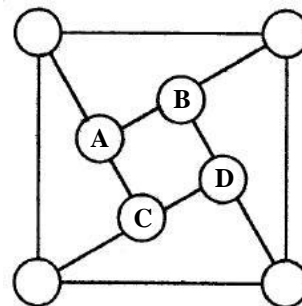
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5. The figure shown below contains two squares and eight circles, the circles are connected by straight lines. Arrange 1~8 eight different numbers into eight circles and each number can be used only once. If the sums of the numbers on 4 diagonal lines (each line connects 3 circles) are the same, and the sum of the 4 numbers on the big square is the double the sum of the 4 numbers on the small square, find the sum of the four numbers A, B, C, D, on each diagonal line.

如图所示，由两个正方形和八个圆组成，这些圆与圆之间以直线相连。将1~8这8个不同的数字分别填入8个圆圈内，每个数字只能使用一次。如果在4条对角线上的3个数字（连线上3个圆圈）的总和是相同的，且大正方形上的4个数字的和是小正方形上的4个数字的和的两倍。那么，对角线上的四个数字A+B+C+D之和是多少？



Answer : \_\_\_\_\_



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6. It is known that A and B are different natural numbers which are less than 2016. So what's the maximum of  $\frac{A-B}{A+B}$  ?

已知 A 和 B 是小于 2016 的非零相异自然数, 那么  $\frac{A-B}{A+B}$  的最大值是多少?

Answer : \_\_\_\_\_

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7. In the Pokémon Go games, to allow a Pikachu to be evolved into Raichu (higher level of Pokemon) needs 50 candies. When a trainer successfully catches a Pikachu he will be awarded 3 candies. When he transfers away unwanted Pikachu that he had caught, he will be awarded 1 candy.

Question, How many pikachu minimum a trainer needs to catch in order to evolve the 1st Pikachu into Raichu.

在宝可梦游戏里，要把一只皮卡丘升级，需要 50 粒宝可梦糖。玩家捉一只皮卡丘可以得到 3 粒宝可梦糖。而且，玩家把捉到的皮卡丘弃之，可以得到多 1 粒宝可梦糖。请问，玩家至少需要捉多少只皮卡丘来升级他的第一只皮卡丘呢？



Answer : \_\_\_\_\_



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8. Muthu and Siti practice running in the sports field. The perimeter of the annular track is 400 m. The distance between point A and point B is 200 meters. Muthu and Siti are starting from the points of A and B at the same time, according to anti-clockwise running. Muthu is running 7m per second, Siti is running 5 m per second, each of them will stop for 5 seconds after running every 100 m. How many seconds does Muthu needs to catch up with Siti?

木都和茜蒂两人在爱民学校的操场练习跑步，400 米环形跑道上，A、B 两点的跑道相距 200 米，木都和茜蒂两人分别从 A、B 两点同时出发，按逆时针方向跑步，木都每秒跑 7 米，茜蒂每秒跑 5 米，他们每人跑 100 米都停 5 秒。那么，木都追上茜蒂需要多少秒？



Answer : \_\_\_\_\_

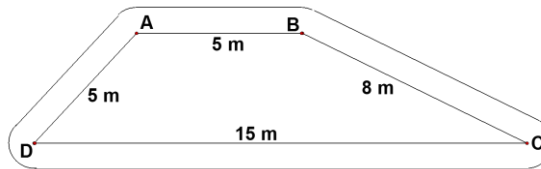
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9. The region ABCD is a trapezium where AB is parallel to DC and  $AB = AD = 5$  m,  $BC = 8$  m,  $DC = 15$  m. The trapezium is surrounded by a paved strip with pebbles and has uniform width of 1 m wide. What is the area of the paved strip? ( $\pi \approx 3.14$ )

梯形 ABCD, AB 平行 DC,  $AB = AD = 5$  m,  $BC = 8$  m,  $DC = 15$  m. 梯形的外围有一条宽为 1 m 的小路。求小路的面积。( $\pi \approx 3.14$ )



Answer : \_\_\_\_\_  $m^2$

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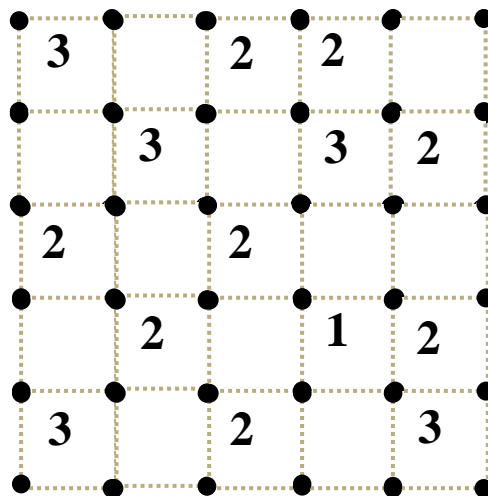
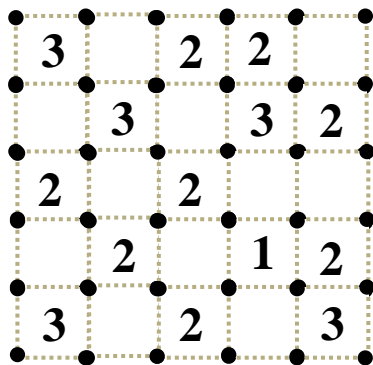
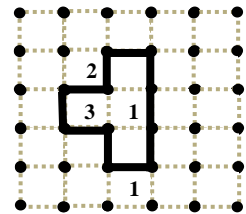
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10. Please connect the adjacent points in the figure below, and draw a closed loop line. The lines drawn must not cross each other. The lines must not be diagonal. The numbers in the grid represent the number of the square's perimeter that the line has come across.

请将下图中，相邻的点连接起来，画出一条封闭的环状线条，线与线不可以交叉，也不可以斜线。方格中的数字代表线条经过此方格的边数。（例如）Example:

(全对才有分)



Answer : \_\_\_\_\_