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PO LEUNG KUK
TEL: 2277 8888 • FAX: 2576 4509

Po Leung Kuk

6th Primary Mathematics World Contest

Team Contest

English Version

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1. A positive integer that satisfies all the conditions below is called a Po Leung number.

   - The number consists of four digits.
   - Each digit is a divisor of 48.
   - Each digit can appear more than once.
   - The sum of the digits is 20.
   - The number is a multiple of 4.

   Find the smallest Po Leung number.

   Answer: _____

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2. A large number "123456789101112131415···454647484950" is formed by writing 1, 2, ... ,49, 50 in increasing order. Find the maximum possible value of the number formed when 80 digits are removed from the original number while the remaining digits stay in the same order.

Answer:_____

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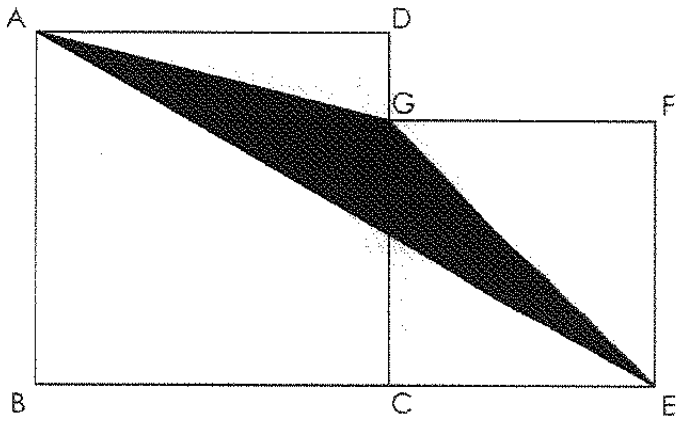
3. In the figure, ABCD and CEFG are both squares. If EF = 12 cm, find the area of △AEG.



Answer: _____

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4. A stair has 10 steps. Susan climbs up from the ground to the top of the stair. Each time, she can move upwards one step, two steps, or three steps. How many different combinations of movements can she use to reach the 10th step?

Answer:_____

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5. All the integers are colored white, except 1, that is colored red. Any integer which exceeds a red number by 20 or by 21 will be repainted red. What is the largest number that will remain white?

Answer: _____

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6. A solid rectangular prism has width 1 cm, length a cm and height b cm, where a, b are integers and a, $b > 2$. The surface of the prism is painted red and then completely cut into small cubes with side of length 1 cm. If the number of cubes with exactly 2 red sides, plus the number of cubes with exactly 3 red sides, minus the number of cubes with exactly 4 red sides is equal to 213, what are the values of a and b?

Answer: _____

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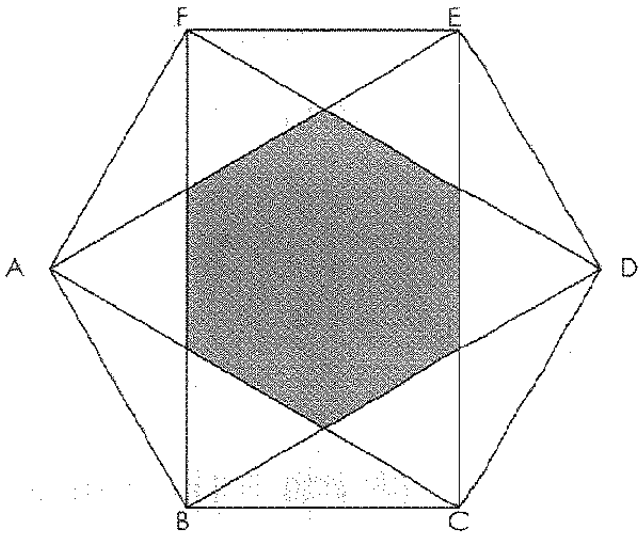
7. In the figure, ABCDEF is a regular hexagon. Find the ratio of the area of the shaded part to the area of the hexagon ABCDEF.



Answer: _____

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8. Towns A, B, and C are connected to each other by several roads, with at least one road connecting any two towns. In going from A to B, one can go directly on one of the roads joining them, or one can travel from A to C on one of the roads joining A and C and then travel from C to B on a road joining C and B. In all, there are 33 routes from A to B, including those via C. Similarly, there are 23 routes from B to C, including those via A. How many routes are there from A to C, including those via B?

Answer: _____

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9. Persons A and B are each peeling potatoes at a constant speed of one potato per minute. They start with the same number of potatoes. Every time A peels a potato, A throws an unpeeled one into B's basket simultaneously. (Assume no loss of time.) At a certain moment, the ratio of B's unpeeled potatoes to A's is 2:1. Ten minutes later, this ratio has increased to 4:1. How long from the start would this ratio be 8:1?

Answer: _____

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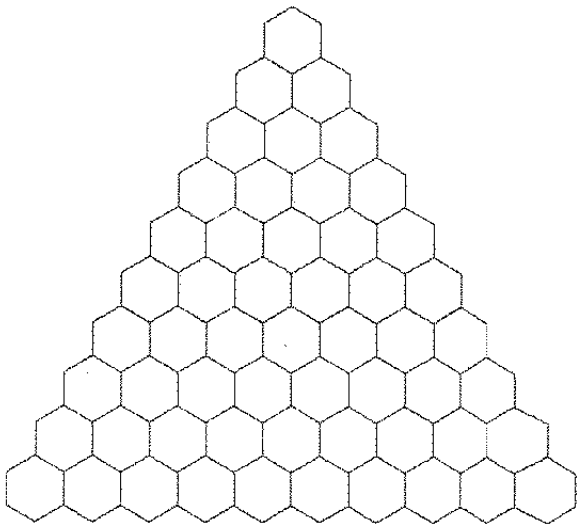
10. The following figure is formed by a group of regular hexagons. What is the maximum number of hexagons that can be shaded in the figure so that no row (horizontal or slanted) contains more than one shaded hexagon?



Answer: _____

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Questions	Answer	Remark
1	1388	
2	99997484950	
3	$72cm^2$	
4	274	
5	380	
6	13 , 17	
7	1/3	
8	21	
9	35minutes	
10	7	