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– level 2

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- 1** Sofia summed all the page numbers from a book starting at 1 and getting 2013. Pablo saw how she did this and realized Sofia skipped a page. How many pages does the book have, and what page did Sofia skip?
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- 2** Construct the midpoint of a segment using an unmarked ruler and a *trisector* that marks in a segment the two points that divide the segment in three equal parts.
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- 3** Many distinct points are marked in the plane. A student draws all the segments determined by those points, and then draws a line r that does not pass through any of the marked points, but cuts exactly 60 drawn segments. How many segments were not cut by r ? Give all possibilities.
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- 4** Is it possible to write 100 odd numbers on a line such that the sum of any 5 consecutive numbers is a square number and the sum of any 9 consecutive numbers is also a square number?
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- 5** Using 600 cards, 200 of them having written the number 5, 200 having a 2, and the other 200 having a 1, a student wants to create groups of cards such that the sum of the card numbers in each group is 9. What is the maximum amount of groups that the student may create?

– level 1

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- 1** Find the number of ways to write the number 2013 as the sum of two integers greater than or equal to zero so that when adding there is no carry over.
Clarification: In the sum $2008 + 5 = 2013$ there is carry over from the units to the tens
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- 2** Elisa adds the digits of her year of birth and observes that the result coincides with the last two digits of the year her grandfather was born. Furthermore, the last two digits of the year she was born are precisely the current age of her grandfather. Find the year Elisa was born and the year her grandfather was born.
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- 3** Let $ABCD$ be a square of side paper 10 and P a point on side BC . By folding the paper along the AP line, point B determines the point Q , as seen in the figure. The line PQ cuts the side CD at R . Calculate the perimeter of the PCR triangle.
https://3.bp.blogspot.com/-ZSyCUznwutE/XNY7cz7reQI/AAAAAAAAAKLc/XqgQn_jm8DQYq6Q7fmCAKJwKt3s400/may%2B2013%2B11.png

- 4** Pablo wrote 5 numbers on one sheet and then wrote the numbers 6, 7, 8, 8, 9, 9, 10, 10, 11 and 12 on another sheet that he gave Sofia, indicating that those numbers are the possible sums of two of the numbers that he had hidden. Decide if with this information Sofia can determine the five numbers Pablo wrote .
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- 5** An 8×8 square is drawn on the board divided into 64 1×1 squares by lines parallel to the sides. Gustavo erases some segments of length 1 so that every 1×1 square he erases 0, 1 or 2 sides. Gustavo states that he erased 6 segments of length 1 from the edge of the 8×8 square and that the amount of 1×1 squares that have exactly 1 side erased is equal to 5. Decide if what Gustavo said it may be true.
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