

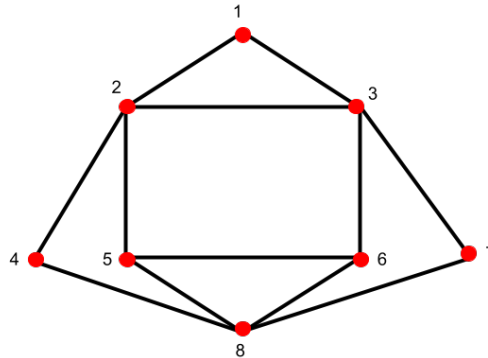


Accuracy Round
 $NC(SMC)^2$
2022

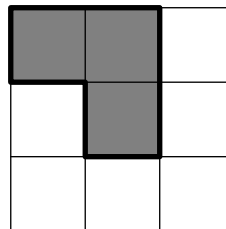
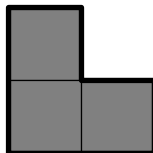
Accuracy Round

Instructions: This round contains 10 problems, and a time limit of 40 minutes. Submit your answers here: <https://forms.gle/yais3DMhWDMMcQiw7>. All answers are integers. Good Luck!

- Mikhail puts his pencil at point 5 in the following picture and traces over the lines in such a way that he traces each line exactly once and never picks up his pencil. Which labeled red point (1, 2, 3, 4, 5, 6, 7 or 8) does his pencil end at?

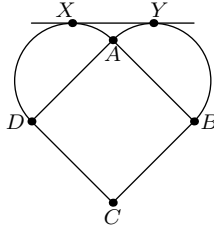


- The news forecasts a 70% chance of rain on Saturday. If it rains on Saturday, there is a 10% chance of it raining on Sunday. Otherwise, if it doesn't rain on Saturday, there is a 90% chance of it raining on Sunday. What is the percent chance that it rains on Sunday?
- Carolina writes the numbers 1, 2, 3, ..., 100 on a whiteboard. Then Scott comes and erases all instances of the digit "2" on the whiteboard (e.g. when he sees the number 21, he erases the 2 and leaves the 1). How many digits remain on the whiteboard?
- How many even positive integers are divisors of the number 2022, which has prime factorization $2 \times 3 \times 337$?
- Isaac has 5 pennies, 5 nickels, and 5 dimes. He randomly takes 5 coins without looking. How many different possible total amounts of money could he have taken?
- An L-shaped version of a domino with 3 cells, as shown below, is known as a triomino. How many ways are there to place a triomino in a 3x3 grid, such that the cells of the triomino line up with the grid lines? One of the ways is shown below (the triomino may be rotated).



- 64 students play in a double elimination ping pong tournament. Each game ends in a win for one player and a loss for the other (there are no draws). Once a player has lost twice, they are eliminated. What is the maximum number of games that can be played before only one winner remains?

8. We say two different positive integers are *besties* if the larger one leaves a remainder of 2 when divided by the smaller one. How many ordered triples of three distinct positive integers (a, b, c) where $3 \leq a, b, c \leq 9$ are there such that a and b are besties, and b and c are besties? For example, $(3, 5, 7)$ and $(7, 5, 3)$ are two different ordered triples that work.
9. Square $ABCD$ has semicircles drawn outside it with diameters AB and AD . We then draw a line parallel to line BD , and tangent to both semicircles at points X and Y , as shown. What is the measure of $\angle XAY$ in degrees?



10. The polynomial $x^3 - 7x^2 + 3x + 1$ can be written as a product of factors $(x - a)(x - b)(x - c)$ for some real numbers a, b, c . What is the value of the expression $(1 - a - b)(1 - b - c)(1 - a - c)$?

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