**FMA Team Mathematics Competition - Zone**

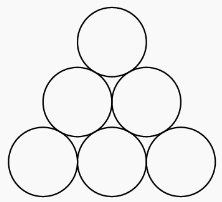
**YEAR 11 – 2017**

$(2(2(2(2(2(2+1)+1)+1)+1)+1)+1)$Y11/1 What is the value of  ?

Y11/2 Sofia ran 5 laps around the 400-meter track at her school. For each lap, she ran the first 100 meters at an average speed of 4 meters per second and the remaining 300 meters at an average speed of 5 meters per second. How much time did Sofia take running the 5 laps?

Y11/3 Supposed that  and  are nonzero real numbers such that . What is the value of 

Y11/4 Last year Isabella took 7 math tests and received 7 different scores, each an integer between 91 and 100, inclusive. After each test she noticed that the average of her test scores was an integer. Her score on the seventh test was 95. What was her score on the sixth test?



Y11/5 In the figure given, 3 of the 6 disks are to be painted blue, 2 are to be painted red, and 1 is to be painted green. Two paintings that can be obtained from one another by a rotation or a reflection of the entire figure are considered the same. How many different paintings are possible?

Y11/6 At a gathering of 30 people, there are 20 people who all know each other and 10  people who know no one. People who know each other a hug, and people who do not know each other shake hands. How many handshakes occur?

Y11/7 Each row of the Galaxy Theatre has 33 seats. Rows 12 through 22 are reserved for a youth club. How many seats are reserved for this club?

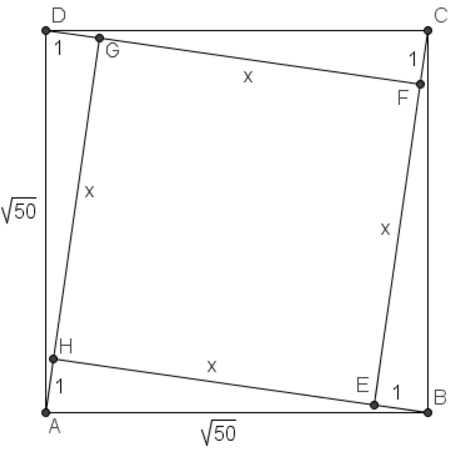
Y11/8 How many two-digit positive integers have at least one 7 as a digit?

Y11/9 A bag initially contains red marbles and blue marbles only, with more blue than red. Red marbles are added to the bag until only  of the marbles in the bag are blue. Then yellow marbles are added to the bag until only  of the marbles in the bag are blue. Finally, the number of blue marbles in the bag is doubled. What fraction of the marbles now in the bag is blue?

Y11/10 In the expression  , the values  are  although not necessarily in that order. What is the maximum possible value of the result?

Y11/11 A supermarket grocer makes a display of cans in which the top row has one can and each lower row has two more cans than the row above it. If the display contains $100$ cans, how many rows does it contain?

Y11/12 Let   be digits with . What is the value of A?



Y11/13 [Square](https://artofproblemsolving.com/wiki/index.php/Square) $EFGH$ is inside the square $ABCD$ so that each side of $EFGH$ can be extended to pass through a vertex of $ABCD$. Square $ABCD$ has side length  and . What is the area of the inner square $EFGH$?

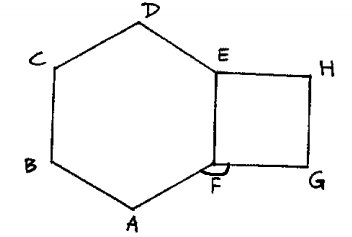
Y11/14 Josh and Mike live 13 kilometers apart. Yesterday, Josh started to ride his bicycle toward Mike's house. A little later Mike started to ride his bicycle toward Josh's house. When they met, Josh had ridden for twice the length of time as Mike and at four-fifths of Mike's rate. How many kilometers had Mike ridden when they met?

Y11/15 What is the value of 

Y11/16 Given that  and  are distinct nonzero real numbers such that  , what is ?

Y11/17 In a recent basketball game, Sneha attempted only three-point shots and two-point shots. She was successful on 20% of her three-point shots and 30% of her two-point shots. Sneha attempted 30 shots. How many points did she score?

Y11/18 Solve



Y11/19 Outside of a regular hexagon ABCDEF we draw square EFGH. How big is the angle AFG?

Y11/20 Let  be distinct [positive integers](https://artofproblemsolving.com/wiki/index.php/Positive_integer) such that the product. What is the largest possible value of the sum ?

TIE BREAKER

Y11/21 The two digits in Jack's age are the same as the digits in Bill's age, but in reverse order. In five years Jack will be twice as old as Bill will be then. What is the difference in their current ages?

Y11/22 Each day, Jenny ate 20% of the jellybeans that were in her jar at the beginning of that day. At the end of the second day, 32 remained. How many jellybeans were in the jar originally?