**FMA Team Mathematics Competition - Finals**

**YEAR 13 – 2017**

Y13/1 What is principal value of the argument of the complex number?

Y13/2 what is the **vertical** asymptote(s) of the graph of the function  ?

Y13/3 A jacket was originally priced $100. The price was reduced by 10% three times and increased by 10% four times in some order. To the nearest cent, what was the final price?

Y13/4 Five students take a test on which any integer score from 0 to 100 inclusive is possible. What is the largest possible difference between the median and the mean of the scores?

Y13/5 How many real solutions does the equation have?

Y13/6 A man has three daughters. The product of their ages is 168, and he remembers that the sum of their ages is the number of trees in his yard. He counts the trees but cannot determine any of their ages. What are all possible ages of his oldest daughter?

Y13/7 Find the smallest positive integer such that is not prime for any integer x.

Y13/8 If

Y13/9  The temperatures and are equal when What temperature is the same in both and ?

Y13/10 Find the point on the graph of  nearest the point (4, 0).

Y13/11 You are given a number, and round it to the nearest thousandth, round this result to nearest hundredth, and round this result to the nearest tenth. If the final result is 0.7, what is the smallest number you could have been given? As is customary, 5's are always rounded up. Give the answer as a decimal.

Y13/12 A man’s salary is reduced by 20%. By what percent would his salary then have to be raised to bring it back to the original amount?

Y13/13 Evaluate 

Y13/14 Fill in the missing blank.



Y13/15 If the curve passes through the point (0, 2) and has its tangent parallel to the x-axis as , then what are the values of a and b?

Y13/16 If then =

Y13/17 If is the inverse of , what is the value of

Y13/18 One ordering of the letters T, U, V and W from left to right is UTVW. What is the total number of orderings of these letters from left to right, including UTVW?

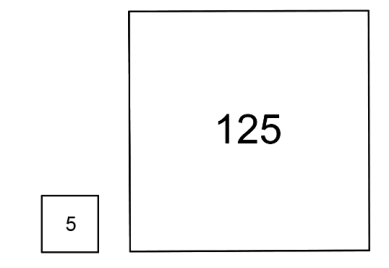
Y13/19 What is the least common denominator for 

Y13/20 What is the remainder when is divided by

TIE BREAKER

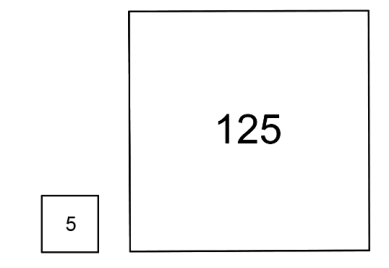
Y13/21 Study the pattern shown below. What is the product of the numbers?



Y13/22 If the two square regions in the figures below have the respective areas indicated in square yards, how many yards of fencing are needed to enclose the two regions? (Assume the regions are fenced separately.)

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Y13/22 If the two square regions in the figures below have the respective areas indicated in square yards, how many yards of fencing are needed to enclose the two regions? (Assume the regions are fenced separately.)