

Pre-Calculus

Instructions: Write the exact answer to each question in the corresponding blank. Remember that the winners in this event are those participants who answer the most questions correctly *in a row* beginning with the first question. So, try to get as far as you can without making a mistake!

1. Given that $i = \sqrt{-1}$, calculate the value of i^{2019} .

1. _____

2. If $f(x) = \frac{9}{x}$ and $g(x) = \frac{x+1}{\sqrt{x+3}-2}$, express the domain of the function $f(g(x))$ using interval notation.

2. _____

3. The function f defined by $f(x) = \frac{cx}{2x+3}$ satisfies $f(f(x)) = x$ for all real numbers except $-3/2$. Find the value of c .

3. _____

4. Suppose g is a function satisfying $g(x^2+1) = x^4 + 5x^2 + 3$. What is $g(x^2-1)$?

4. _____

5. Solve the inequality $\ln(x^2-4) \leq 0$ and give the answer using interval notation.

5. _____

6. Simplify the value of x , if x is a real number and $x = \csc\left(2 \arctan\left(-\frac{6}{5}\right)\right)$. Write your answer as a rational number in lowest terms.

6. _____

College of Charleston Math Meet 2019

Pre-Calculus Timed Sprint

Name (please print): _____

School: _____

The grading for the Timed Sprints is unusual! Your grade will be the number of questions answered correctly, starting with the first question, before you make a mistake. For example, if you only answer questions 1-4 correctly and questions 7-13 correctly, your grade will be a "4" since you did not get question 5 right. You will have a limited amount of time to work on the sprint. Your paper will be collected at the end of this period.

By my signature below I certify that all of the work completed on this sprint is my own.