ACTIVITY: DERIVATIVE MATCHING

INSTRUCTIONS

Pick a random graph. Do not show it to your classmates throughout this activity. Carefully examine the features of your graph. The function whose graph you are holding could be the derivative of somebody else's function, but it could also be an anti-derivative, or both! In this activity you will spend some time preparing two sets of questions that will help you search for a match. You will interview everyone in the classroom. The interviews ought to be conducted in pairs. You and your partner will exhaust both sets of questions. To avoid confusion, you should plan to only trade roles (interviewer & interviewee) once. Three-way interviews are permissible as well. Just make sure your peers have the opportunity to ask their questions.

Spend no more than ten minutes preparing the questions that you are going to ask during your interviews. Focus on what you have learned so far in differential calculus: increasing/decreasing behavior, concavity, inflection points, the derivative as a measure of slope etc. Whenever possible, try to avoid pre-calculus questions (domain, range, end behavior, x and $y-$intercepts).

Here are a few examples to get you started:

- "Are your $y-$values positive when x is between 1 and 2?" If your own graph is increasing over this interval, an affirmative response would confirm the suspicion that you could be interviewing the holder of the derivative of your function. By contrast, an affirmative response could also imply that if your function is concave up on the given interval, you could be interviewing the holder of the second derivative of your function.
- "Is your function defined at $x=1$?" If your function has a corner at $x=1$ or the derivative does not exist, this would be a good question to ask when searching for a derivative.

You should each prepare two sets of questions, one assuming you are holding somebody's derivative, and the other assuming you possess the graph of the anti-derivative (i.e. somebody has your derivative function).

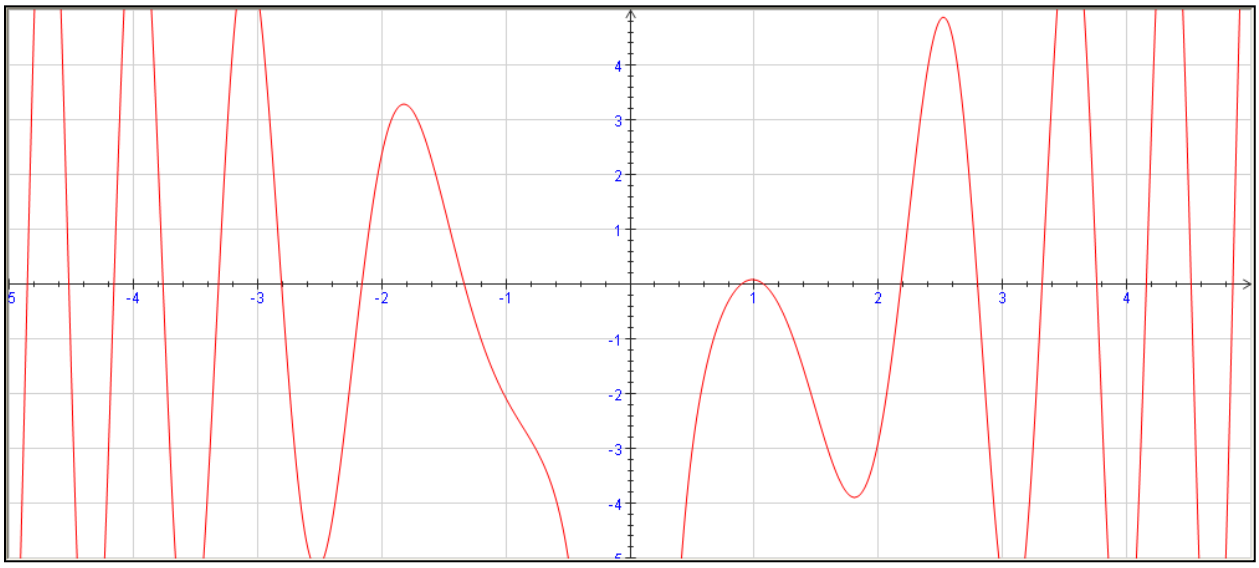
Write your questions neatly, and remember not to reveal your graph to your classmates.

If there is no agreement after an interview, move on to the next person. You'll eventually find a match as you complete the interviews. When both you and your partner have exhausted your questions and are convinced that there is a match, request assistance from the instructor to verify the match before you reveal the sketches. The match you make may be part of a three function chain f, f', f'', so keep searching!

MY TWO SETS OF QUESTIONS:

GRAPH ID: EUCLID

YOUR NAME _____



GRAPH ID: FERMAT

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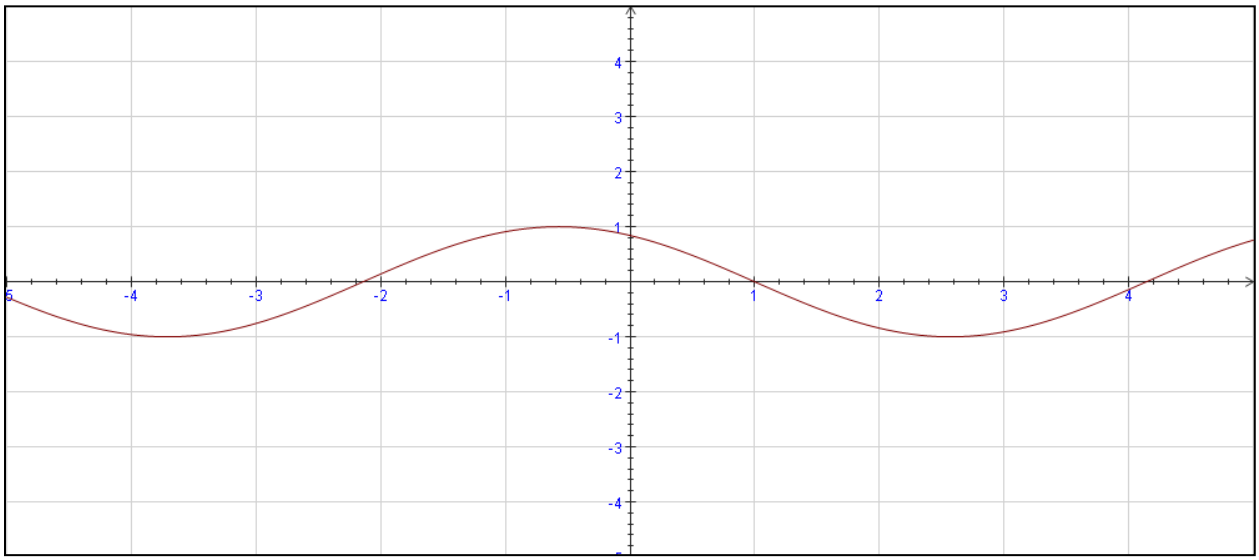

GRAPH ID: ARCHIMEDES

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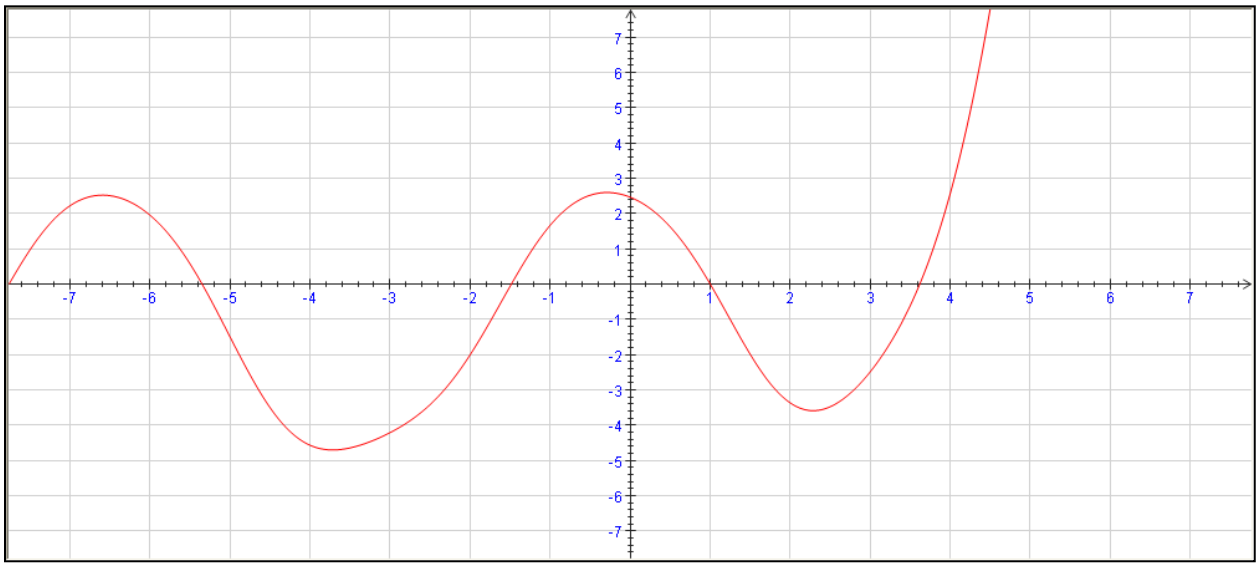
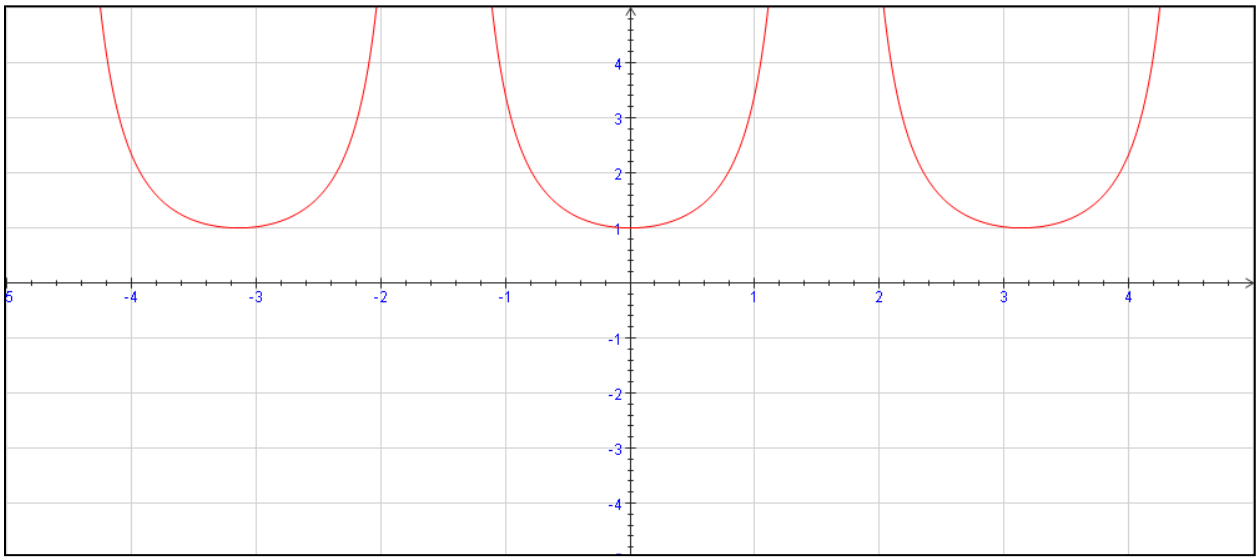


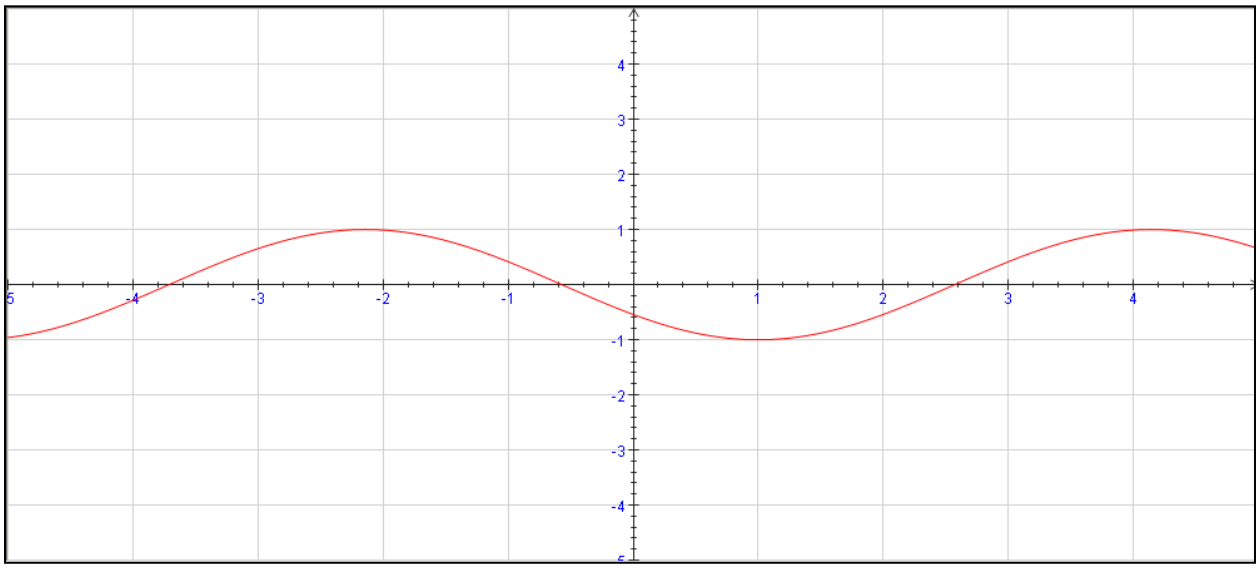
GRAPH ID: NEWTON

YOUR NAME _____



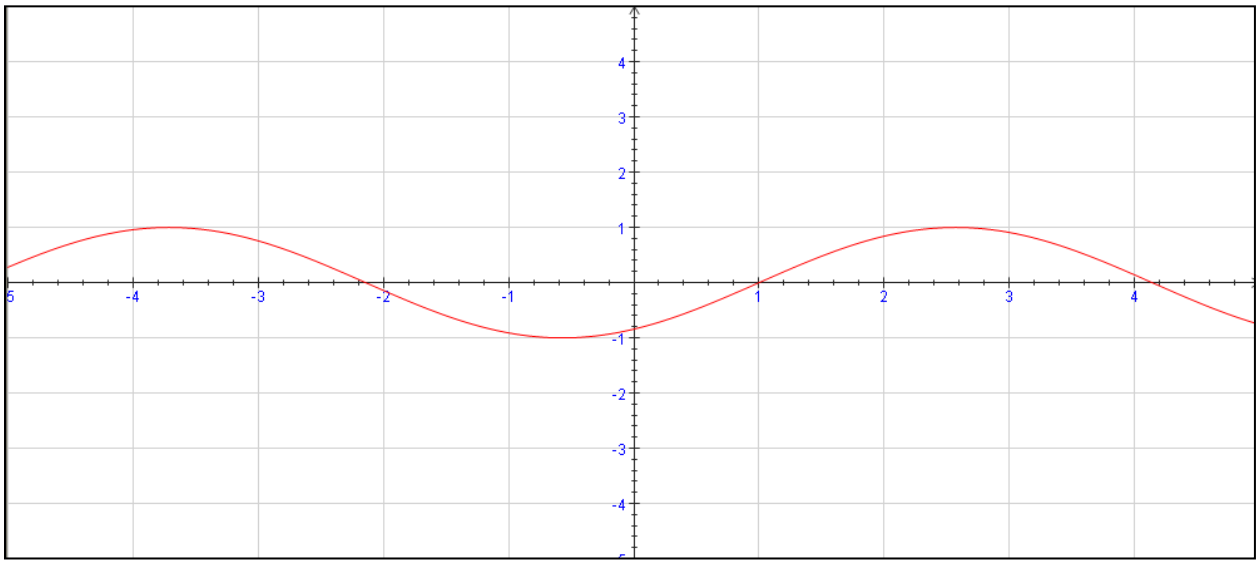
GRAPH ID: LAGRANGE

YOUR NAME _____



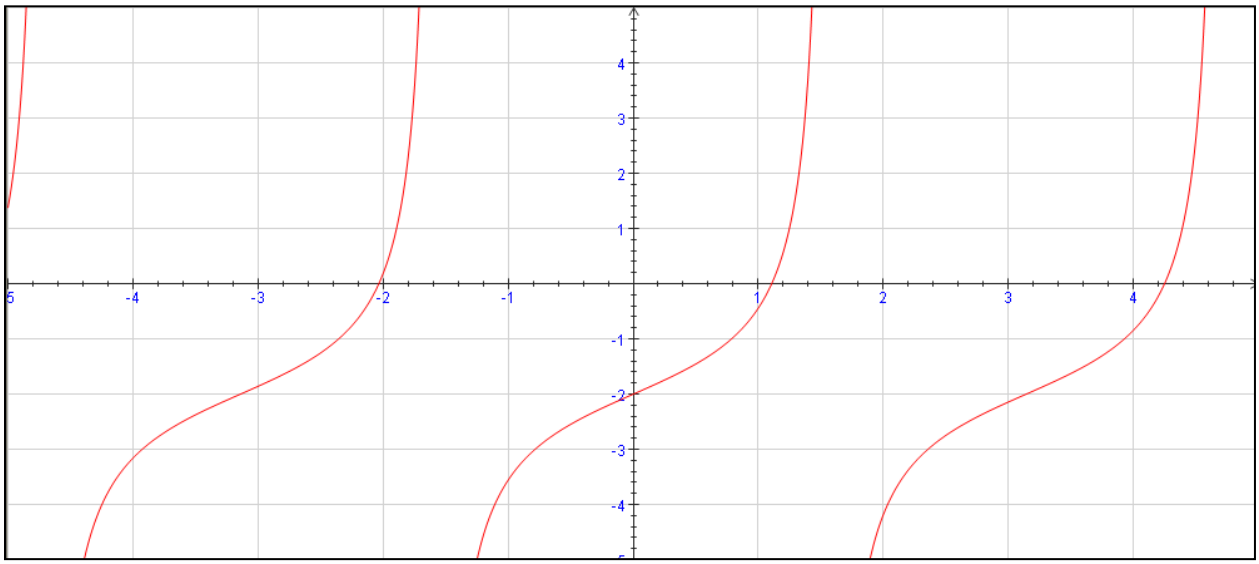
GRAPH ID: EULER

YOUR NAME _____



GRAPH ID: RIEMANN

YOUR NAME _____



GRAPH ID: LEIBNIZ

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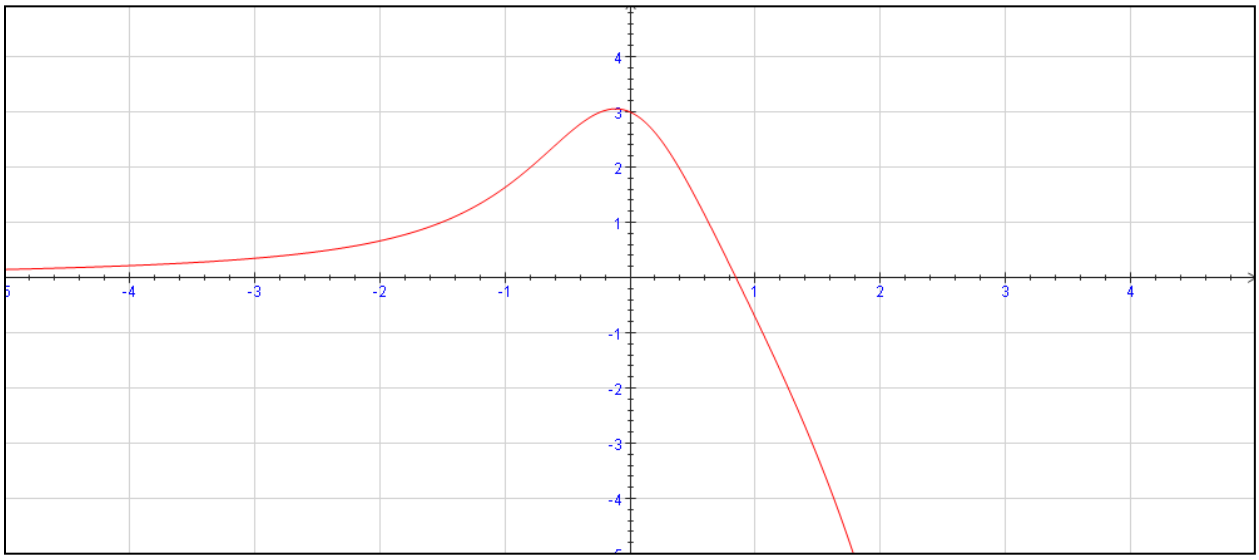

GRAPH ID: GAUSS

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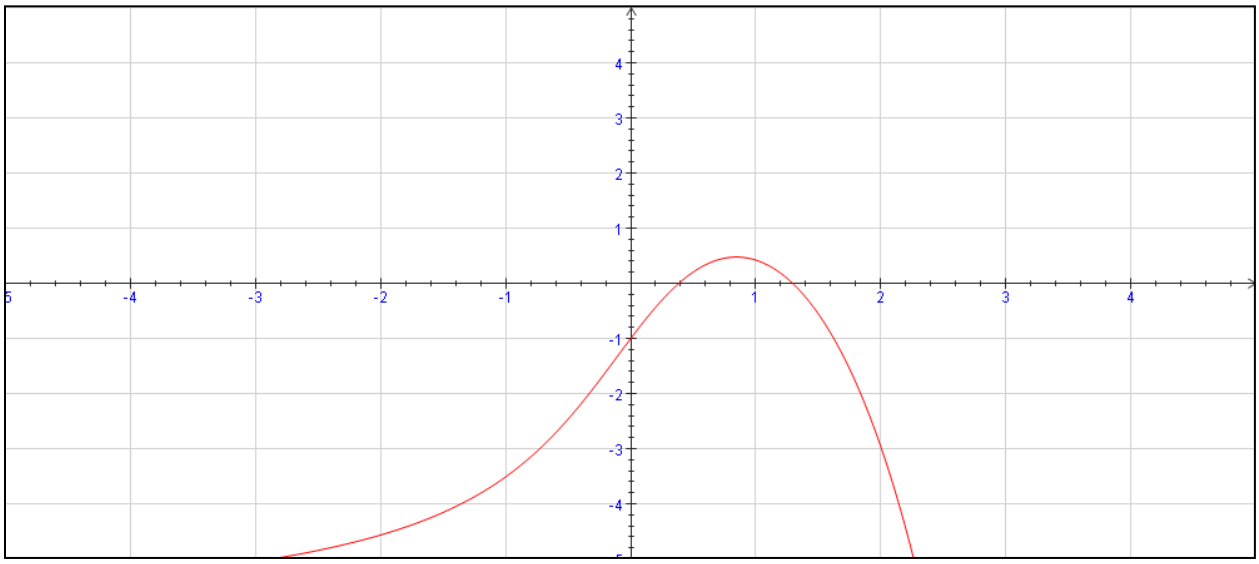

GRAPH ID: DESCARTES

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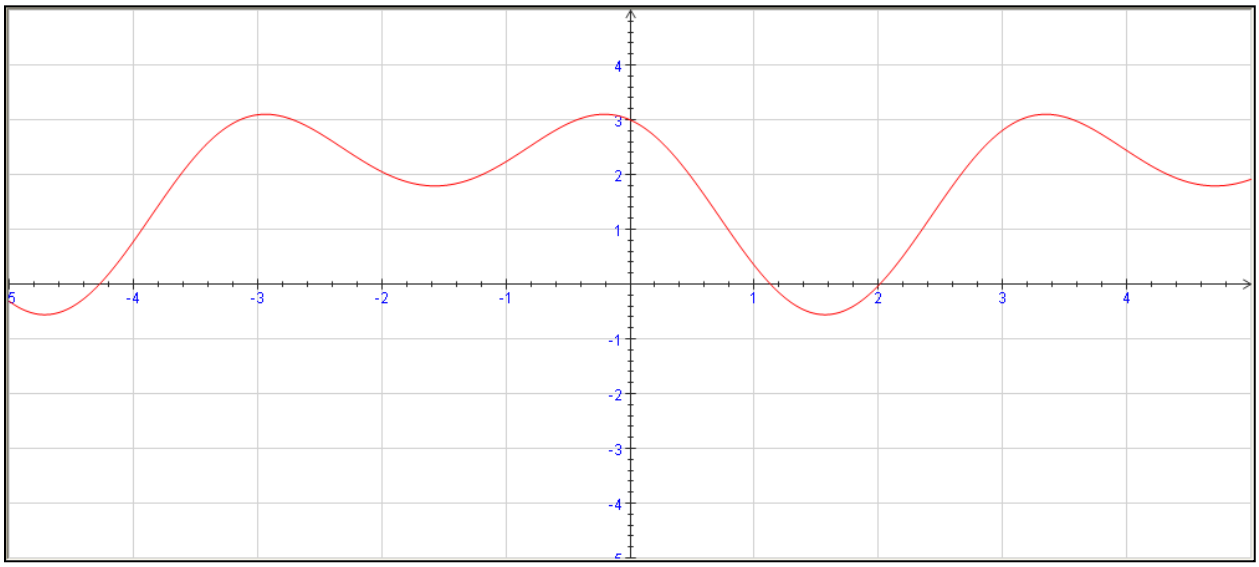
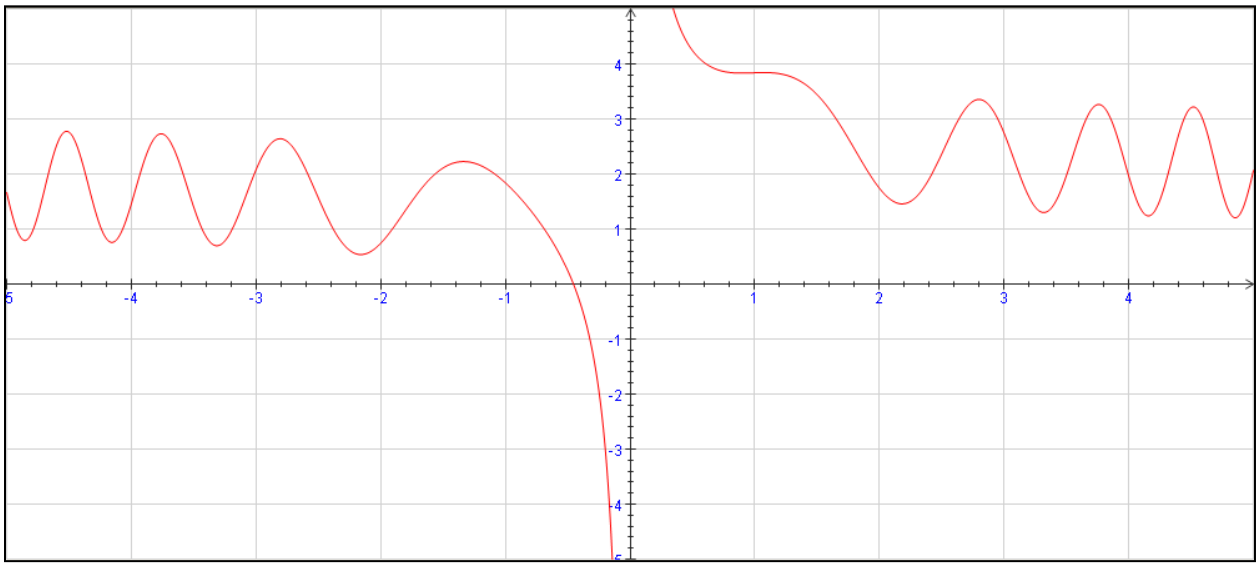


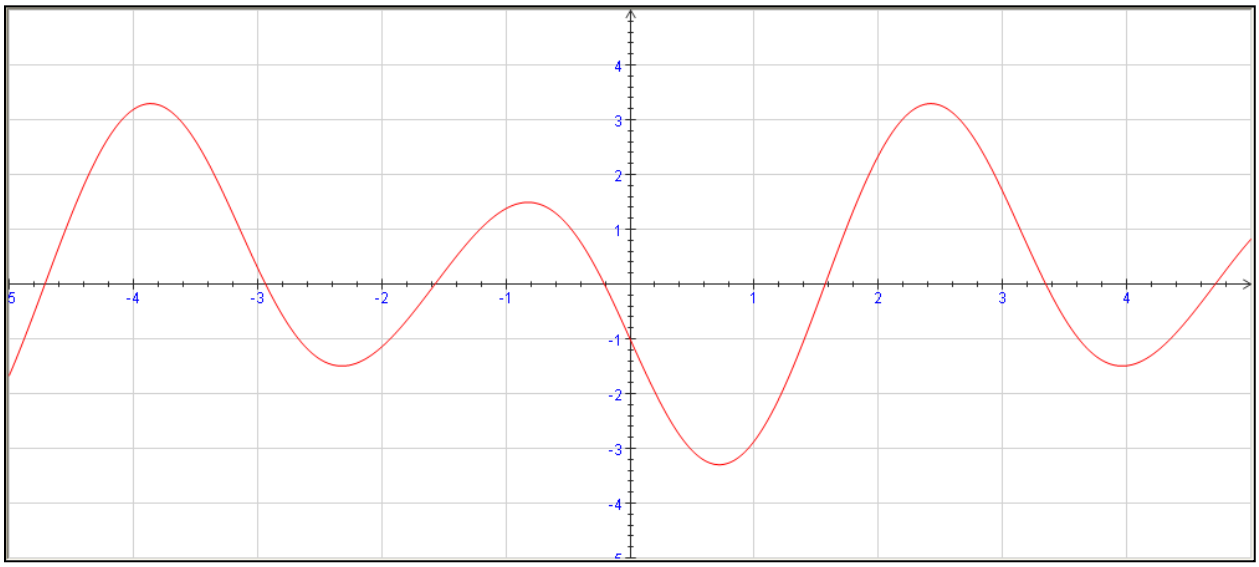
GRAPH ID: GALOIS

YOUR NAME _____



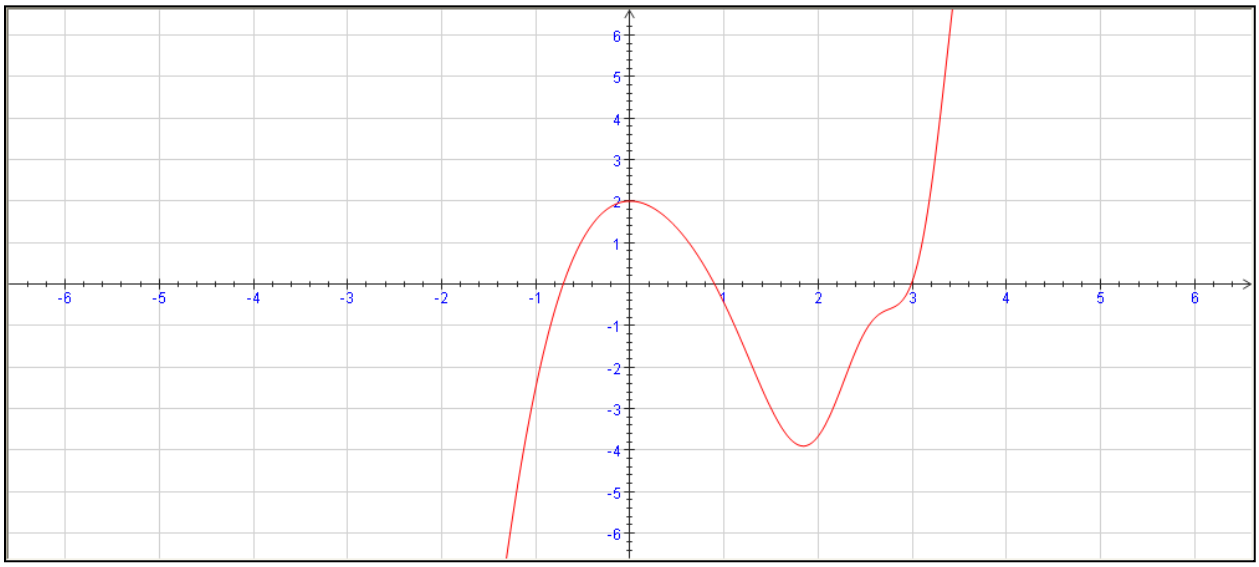
GRAPH ID: RAMANUJAN

YOUR NAME _____



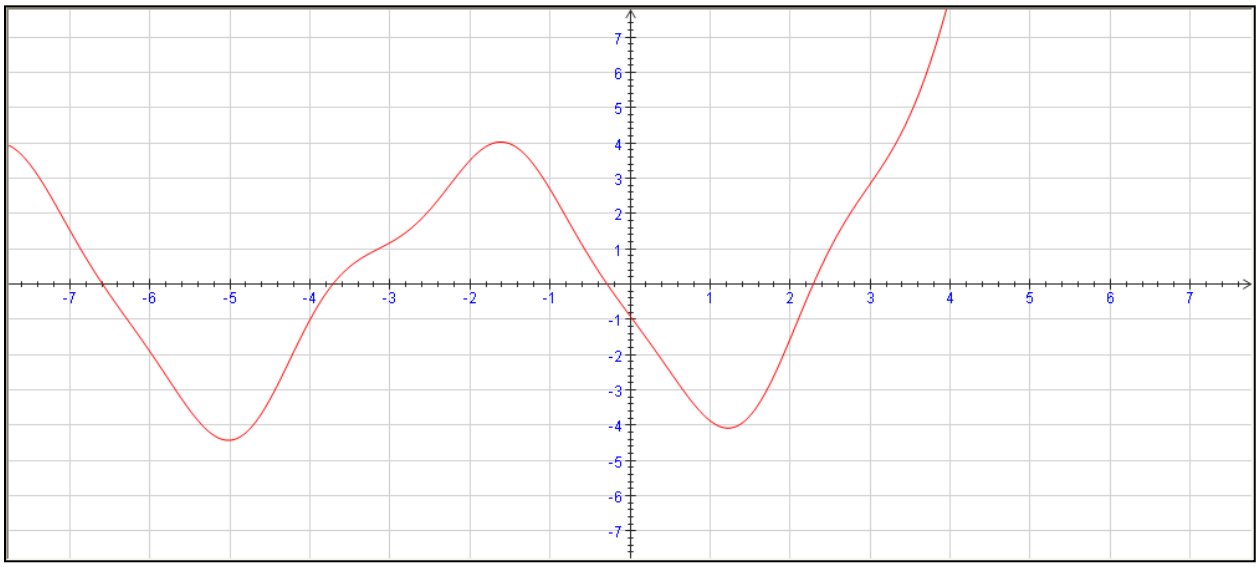
GRAPH ID: CARDANO

YOUR NAME _____



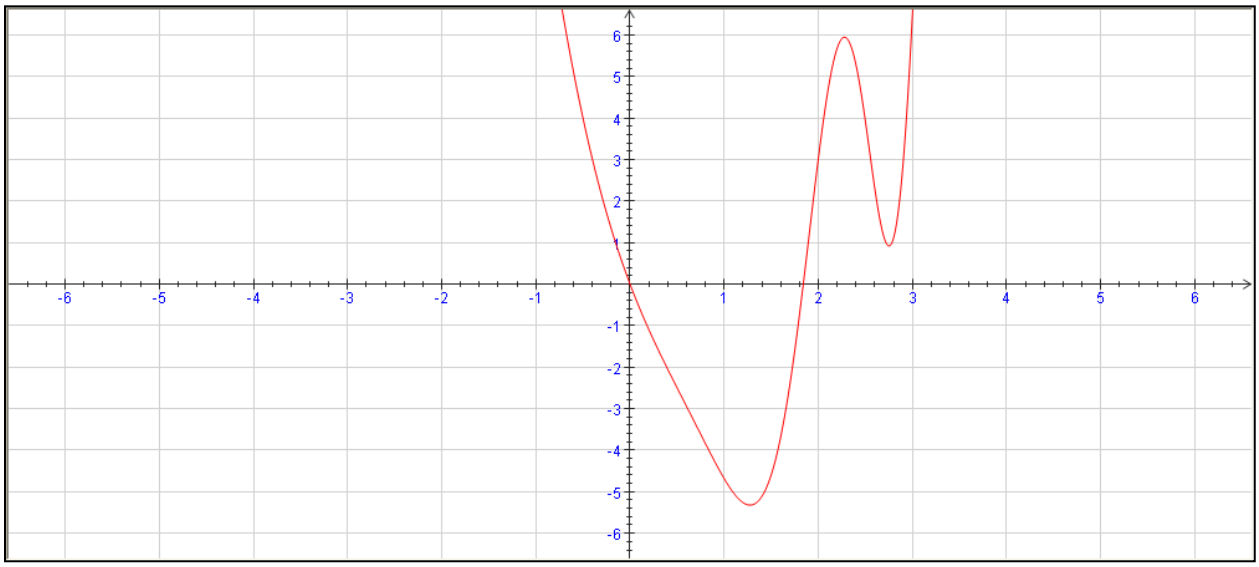
GRAPH ID: POINCARE

YOUR NAME _____



GRAPH ID: BERNOULLI

YOUR NAME _____



ANSWER KEY FOR THE INSTRUCTOR

F	*F'*	*F"*
CARDANO	BERNOULLI	
GALOIS	EUCLID	
ARCHIMEDES	POINCARE	
DESCARTES	RAMANUJAN	
RIEMANN	NEWTON	
FERMAT	LAGRANGE	EULER
GAUSS	LEIBNIZ	

GRAPHE EASY SNAPSHOT