Calculus 1 for Social Sciences **Name:** _____
Winter 2019
Exam 3 **Time Limit: 90 min**

- **DO NOT open the exam booklet until you are told to begin. You should write your name and section number at the top and read the instructions.**
- Organize your work, in a reasonably neat and coherent way, in the space provided. If you wish for something to not be graded, please strike it out neatly. I will grade only work on the exam paper, unless you clearly indicate your desire for me to grade work on additional pages.
- You needn't spend your time rewriting definitions or axioms on the exam.
- **Show all your work. Correct answers without supporting work may not receive credit.**
- When you have completed your test, hand it to me and have a great night.

Problem	Points	Score
1	30	
2	10	
3	20	
Total:	60	

1. For the function $f(x) = \dfrac{1}{x^4 - 6x^2}$

   (a) (2 points) find the domain of $f(x)$.

   (b) (2 points) what are the x and y intercepts

   (c) (4 points) find the vertical and horizontal asymptotes.

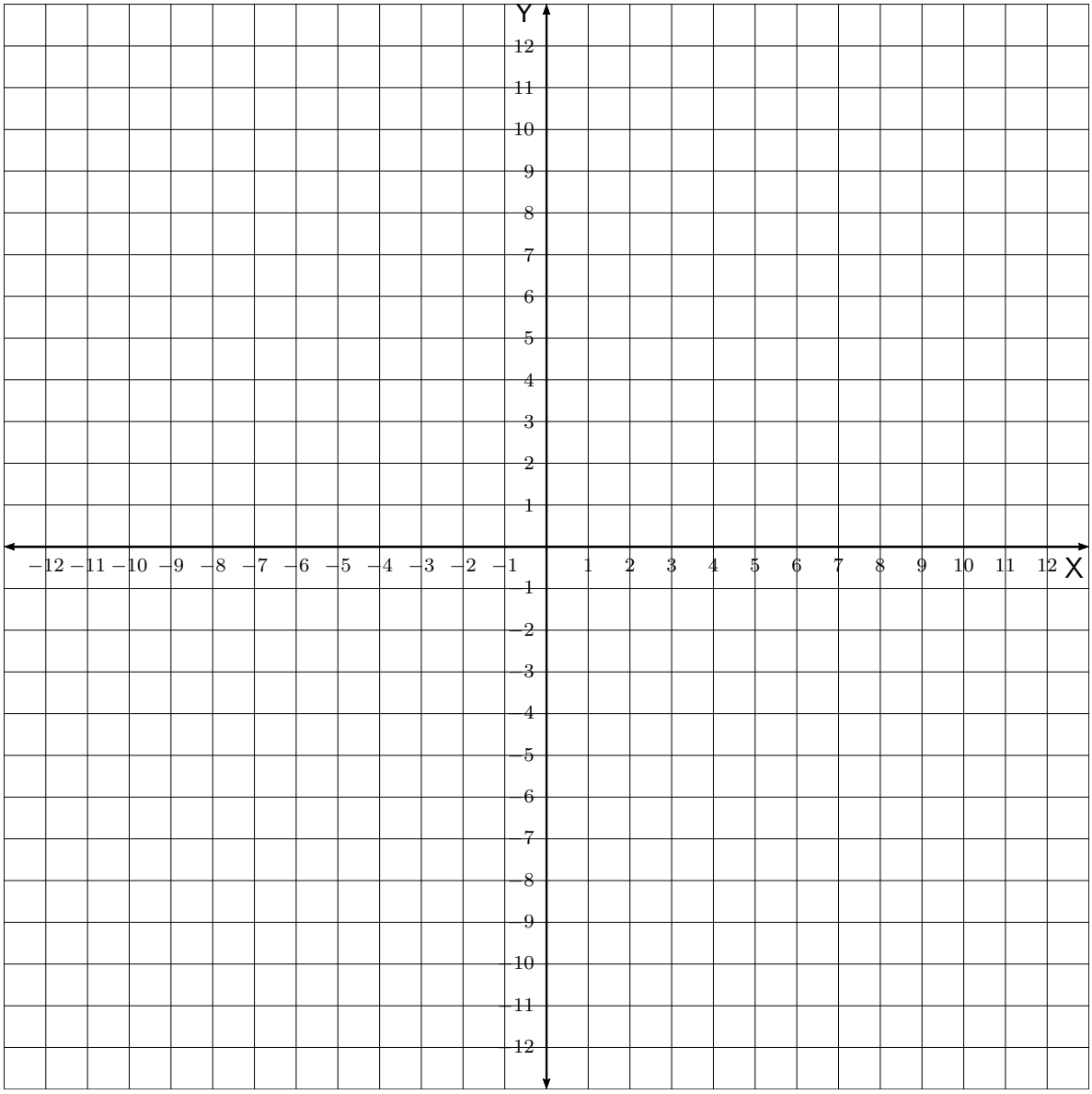
   (d) (3 points) Find the critical points of $f(x)$.

(e) (8 points) Find the intervals where $f(x)$ is increasing and decreasing.

(f) (3 points) Find the inflection points of $f(x)$

(g) (8 points) Find the intervals of concavity.

2. (10 points) Using the information in the previous question plot the graph on the grid below



3. (20 points) A farmer with 750 ft of fencing wants to enclose a rectangular area and then devide it into four pens with fencing parallel to one side of the rectangle. What is the largest possible total area of the four pens? (be sure to justify that the area is indeed a maximum)