

57770 Exam 1

**Honor Statement:** I \_\_\_\_\_ understand that this is a closed notes, eyes on my own paper, no calculator, no talking exam. I assure you and my fellow students that all of the work on this exam is my own and I will not cheat in any way, shape or form on this test.

I also agree that I will turn in this exam on time and not go over the time allotted.

Signed: \_\_\_\_\_

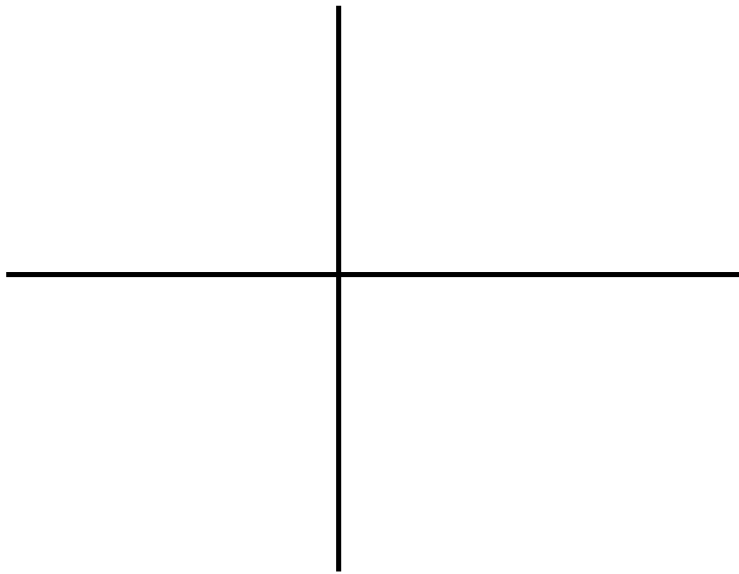
Be sure to show work. No partial credit can be given if you do not. If you do not show your work you will not be able to get full credit. If you use short cuts and/or tricks be sure to explain what you are doing. Box your final answers to distinguish your final answer to distinguish it from any relevant work used to get it. Come ask me if you don't understand any questions.

WAIT FOR ME TO ANNOUNCE THAT YOU SHOULD BEGIN THE TEST BEFORE TURNING THIS PAGE.

**Problem 1** (15 Points). For the following problem  $f(x) = 4x^2 - 1$

(3 pts) a) Find the domain of  $f(x)$ .

(6 pts) b) Graph  $f(x)$  and label at least 3 points on your graph.



(3 pts) c) On what interval(s) is  $f(x)$  positive?

(3 pts) d) What interval(s) is  $f(x)$  negative?

**Problem 2** (15 points). For the following problem use  $f(x) = \sqrt{x+2}$  and  $g(x) = 4x^2 + 4x + 1$ .

(5 pts) a) Find the domain of  $f(x)$ .

(5 pts) b) Find the domain of  $g(x)$ .

(5 pts) c) Find the domain of  $\frac{f}{g}(x)$ .

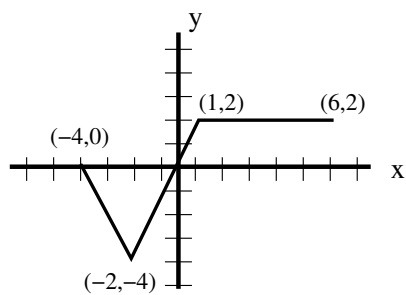
**Problem 3** (15 points). *Use what you know about linear functions to answer the following questions.*

(5 points) a) Give the equation for a line through  $(-4,8)$ ,  $(2,-1)$

(5 points) b) Graph the line from part a) and label the x and y intercepts.

(5 points) c) Find the intersection of the line from part a) with the line  $y = 2x + \frac{11}{2}$ .

**Problem 4** (15 points). *Given the graph of the function below:*



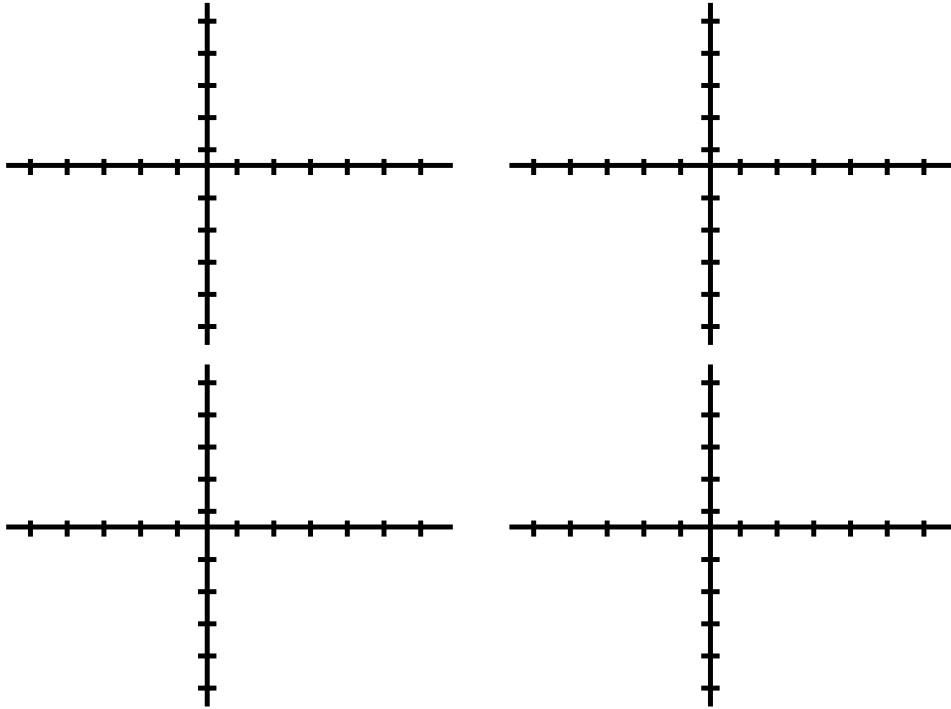
(3 points) a) On what interval(s) is the function positive?

(3 points) b) On what interval(s) is the function negative?

(3 points) c) What is the range of the function?

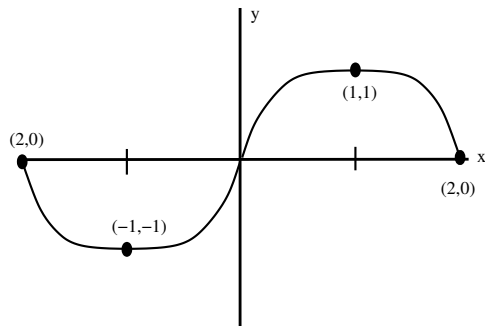
(6 points) d) Express the function as a piece-wise defined function.

**Problem 5** (10 points). Graph  $f(x) = 3(x - 2)^4 + 5$  using transformations.  
Label at least one point on each graph.



**Problem 6** (15 points). Are the following following functions even, odd or neither? Be sure to show work. If the function is presented as a graph, give a reason.

(5 points) a)



(5 points) b)  $Q(x) = \frac{|x|}{x^3 + 5x^2}$

(5 points) c)  $f(x) = \frac{|x|}{x^3}$

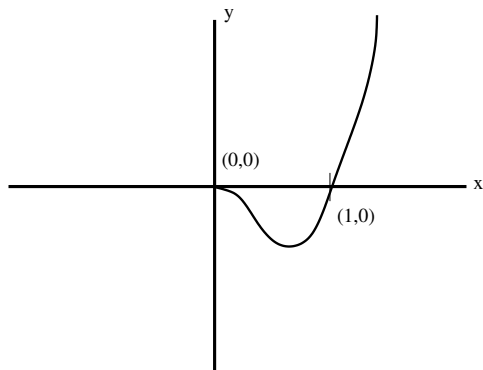
**Problem 7** (15 points).  $f(x) = -2(x - 3)^2(x - 1)(x + 1)$ .

(4 points) a) What values of  $x$  make  $f(x) = 0$ ?

(6 points) b) Where is  $f(x)$  positive? Where is  $f(x)$  negative?

(5 points) c) Sketch a graph of  $f(x)$ .

(max of 5 points) Extra Credit : The graph below is of  $h(x) = x^2(x - 1)$  on the domain  $x \geq 0$ .



a) Give an odd function with domain all real numbers that agrees with  $h(x)$  on  $x \geq 0$ . Sketch the graph of this function.

b) Give an even function with a domain all real numbers that agrees with  $h(x)$  on  $x \geq 0$ . Sketch the graph of this function.

If you need to use this page, be sure to indicate which problem you are working on.