Name:

Math 10a
September 25, 2014
Quiz #3

1. Let $f(x) = \sqrt{x^2(1 - x^2)}$

    (a) (1 point) For what values of x is f defined?

    (b) (2 points) What are the largest and smallest values of $f(x)$ on its domain of definition?

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2. (a) (5 points) Graph
$$\frac{(x-2)^2}{x+2}.$$
Indicate (if any) critical points, inflection points, asymptotes, and intercepts.

3. (1 point) A population of bacteria P (measured in mg) changes with time t according to the equation
$$\frac{dP}{dt} = k(M - P)$$
for some positive constants k and M. If, initially, there are 10 mg of bacteria and then the researcher returns later to find only 6 g of bacteria, what can you say about M?

4. (1 point) The growth rate G of an amoeba population is modeled by
$$G(t) = a_1 t - a_2 t^3$$
for positive constants a_1 and a_2 and $t > 0$. When is the amoeba population growing fastest?