



Math 181
Recitation Quiz 5 (3.1, 3.2 and 3.4)

Full Name _____
Full Name _____
Full Name _____
Date _____

Open notes, open book. No more than 3 per group.
All questions worth 10 points except where noted.
No work = No credit.

1. Find the domain for the function $f(x) = \sqrt{1 - 2^{-x}}$
2. Find $\lim_{x \rightarrow 2^-} e^{3/(2-x)}$
3. (15 points) A bacteria culture grows with constant relative growth rate. After 2 hours there are 600 bacteria and after 8 hours the count is 89,000. Find the initial population and the expression for the population p after t hours. When will the population reach 100,000? (Round all values to 2 decimal places)
4. (15 points) The half life of a compound is 28 years. Suppose we have an initial quantity of 1000g. Find the mass that remains after t years. When will there be less than 1g left? (Round all values to 3 places)
5. In the theory of relativity, the mass of a particle with speed v is given by $m = f(v) = \frac{m_0}{\sqrt{1 - v^2 / c^2}}$ where m_0 is the rest mass of the particle and c is the speed of light in a vacuum. Find the inverse function of f and explain its meaning.
6. Find a formula for the inverse of the function $y = \frac{1 + e^x}{1 - e^x}$. What is the domain of the original function? What is the domain of the inverse function?
7. (10 points each) Solve the following equations for x . Round your answer to 2 decimal places and be sure to check your solution.
 - a) $e^{2x+3} - 7 = 0$
 - b) $\ln(5 - 2x) = -3$
8. Find dy/dx for the equation $xe^y + ye^x = 1$