

MA 113
Quiz 10 - December 5, 2013

Name: _____

1. Evaluate the following integrals:

(a) $\int \frac{\sec^2(\sqrt{x})}{\sqrt{x}} dx$

(b) $\int_0^3 |x^2 - 4x + 3| dx$

2. Raphael's father buys Raphael a Mogwai, a cute toy. Raphael is told to never get water on the Mogwai. Raphael, however, is a careless boy and spills water on the toy. Raphael starts with only one Mogwai at time $t = 0$. However, in a minute, at time $t = 1$, there is a total of 6 toys. Let $P = P(t)$ be the population of the toys at time t where t is measured in minutes. Assume that the growth of the toys is continuous and that once one Mogwai is wet, all future Mogwai are wet as well.

- (a) Since the growth of the population depends upon the current population, then $P = Ce^{kt}$. Find C and k .

- (b) If Raphael's father comes into the room at time $t = 10$, approximately how many Mogwai will there be?