You will have twenty minutes to take this quiz. Read the instructions carefully. There are more questions on the back of this page.

1. (*4 points*) *You do not need to show your work. Only the answer will be graded.*

1. (2 *points*) For $f(x) = \int_0^{\sin(x)} e^{-t^5} dt$, find the first order Taylor polynomial of $f(x)$ around zero and use this to find an approximation for $f(.15)$.

2. (2 *points*) For $f(x) = x^6 + x + 1$, find the degree two Taylor polynomial of $f(x)$ around one. (In other words, find $T_4^1 f(x)$.)

2. (*6 points*) *Show your work. Partial credit may be awarded.*

A tank begins with 100 litres of salt water in it. Fresh water is pumped in at a rate of ten litres per minute and the mixed water is pumped out at a rate of five litres per minute. If the tank initially has ten kilograms of salt in it, how many kilograms of salt will remain in the tank in thirty minutes? Assume the water is always perfectly mixed.