MAT 1322 **Assignment 2** (Due THU 26th of MAY at 19:00) **Student Number**:

Name:.....

SHOW all YOUR work. NO late assignments!!!!!!!!!!!!!!!!!!!!!!!!

Problem 1. Use Euler's method with step size 0.4 to estimate $y(2)$, where $y(x)$ is the solution of:

$\frac{dy}{dx} = -x^2 + yx$, $y(0) = 1$.

Problem 2. Solve $y' = \frac{xy\sin(x)}{2+y}$, $y(0) = 2011$.

Problem 3. A circular diving pool has a diameter of 24 ft, the sides are 5 ft high, and the depth of the water in the pool is 4 ft. Compute the work required to pump all the water out over the side. *Recall* that in class was given that the water weighs 62.5 lb/ft^3.

Problem 4. BEER-50 has a half-life of 28 days. A sample of BEER-50 (found in my refrigerator) has a mass of 50 mg initially.

(a) Find the mass remaining after t days.

(b) Find how long it takes the sample of BEER-50 to decay to a mass of 4 mg.