



CALCULUS II
SPRING 2011

ASSIGNMENT 7.1
DUE OCTOBER 7

Exercise 1. Solve the differential equation $\frac{dy}{dx} = \frac{\sqrt{x}}{e^y}$.

Exercise 2. Solve the differential equation $(x^2 + 1)y' = xy$.

Exercise 3. Solve the differential equation $\frac{dz}{dt} + e^{t+z} = 0$.

Exercise 4. Solve the differential equation $\frac{du}{dt} = 2 + 2u + t + tu$.

Exercise 5. Solve the initial value problem $xy' + y = y^2$, $y(1) = -1$.

Exercise 6. Solve the initial value problem $\frac{dP}{dt} = \sqrt{Pt}$, $P(1) = 2$.

Exercise 7. Solve the initial value problem $\frac{dL}{dt} = kL^2 \ln t$, $L(1) = -1$.

Exercise 8. Find the function f so that $f'(x) = f(x)(1 - f(x))$ and $f(0) = \frac{1}{2}$.

Exercise 9. Solve the differential equation $xy' = y + xe^{y/x}$ by making the change of (dependent) variable $v = y/x$.

Exercise 10. A vat with 500 gallons of beer contains 4% alcohol (by volume). Beer with 6% alcohol is pumped into the vat at a rate of 5 gal/min and the mixture is pumped out at the same rate. What is the percentage of alcohol after an hour?