

**MATH 250
Exam #3
Fall 2006**

Show work whenever you can and check your results as time permits.

Name:

Prob. Num.	Point Value	Points Given
1	20	
2	20	
3	20	
4	20	
5	20	
Total	100	
Curve		
Grade		

1) A brine solution flows at a constant rate of 7 L/min into a large tank that initially held 150 L of brine solution in which was dissolved 0.8 kg of salt. The solution inside the tank is kept well stirred and flows out of the tank at a rate of 5 L/min. If the concentration of salt in the brine entering the tank is 0.3 kg/L, determine the mass of salt in the tank after t min.

2) A red wine is brought up from the wine cellar, which is a cool 10°C , and left to breathe in a room of temperature 23°C . If it takes 10 min for the wine to reach 15°C , when will the temperature of the wine reach 18°C ?

3) Solve the initial value problem: $y'' - 6y' + 9y = 0$; $y(0) = 2$, $y'(0) = 25/3$

4) Find a general solution: $y'' + 10y' + 41y = 0$

5) Find a general solution: $y''' + 3y'' - 4y' - 12y = 0$