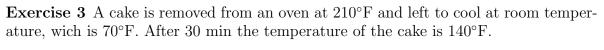
${\bf Math~242~Test~1,\,Friday~21~September}$

Name:	Last 4 digits of SSN:
	o work means no credit. The points are: 4: 10, ex5: 10 plus 5 point for the writing.
applied for a distance of	arks made by an automobile indicated that its brakes were fully 75 m before it came to a stop. The car in question is known eleration of $20 \ m/s^2$ under these conditions.
1. Find the expression v_0 for initial velocit	n of the motion of the automobile when the brakes start (takey).
2. How fast - in km/h	- was the car traveling when the brakes were first applied ?
Exercise 2 We are cons	sidering the following differential equation:
	3xy' + y = 12x.
1. On which intervals	does there exist a unique solution?

2. Solve the equation with the initial value y(1) = 0.



1. Using the Newton's law of cooling, determine the temperature of the cake at a time t (we take t = 0 when the cake is removed from the oven).

2. When will the temperature of cake be 100°F (you can use that $\frac{\ln(14/3)}{\ln(2)} \approx 2.22$)?

Exercise 4 We consider the following differential equation:

$$(\cos x + \ln y)dx + \left(\frac{x}{y} + e^y\right)dy = 0.$$

1. Show that this equation is exact.

2. Then solve this differential equation.

Exercise 5 We consider the following differential equation:

$$x(x+y)y' + y(3x + y) = 0.$$

1. Write this differential equation as a homogeneous one.

2. Then solve this differential equation (you can use a formula of type $\int \frac{f'}{f} = \ldots$)