MATHEMATICS 2 (MA10193)
EXAMPLES SHEET 4

I will look at work given to me or left in the folder on my office door (1W3.35). If you do not have a copy of this sheet, you can find one at
`http://www.bath.ac.uk/~masgks/MA10193/sheet4.ps` *(or* `.dvi` *or* `.pdf`*).*

1. Solve the differential equation

$$\frac{d^2y}{dx^2} - 8\frac{dy}{dx} + 41y = 0$$

if $y = 1$ when $x = 0$ and $y = 0$ when $x = \pi/2$.

2. Find a solution to

$$\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 10y = 24\sin x$$

which satisfies $y = 0$ when $x = 0$ and $y = 1$ when $x = \pi/4$.

3. Solve the simultaneous equations

$$7\frac{dx}{dt} + 3y = x$$
$$3\frac{dy}{dt} - 4x = 0.$$

4.Solve the simultaneous equations

$$\frac{dx}{dt} + 3\frac{dy}{dt} + 3x - 4y = 3t^2$$
$$2\frac{dx}{dt} + \frac{dy}{dt} - 4x + 5y = -2t + 2$$

GKS, 12/04/05