Farhad Goodarzi
fgoodarzi@gwu.edu

1) Use the following example,

$$y'' (x) + 8y' (x) + 2y(x) = \cos(x);\ y(0) = 0,\ y'(0) = 1$$

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eqn = 'D2y + 8*Dy + 2*y = cos(x) ';
inits = 'y(0)=0, Dy(0)=1';
y=dsolve (eqn, inits, 'x')
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and solve the given differential equations symbolically.
i) $2x^2y'' + 3xy' - y = 0$
ii) $dy/dt + 4y(t) = e^{-t}$, $y(0) = 1$
iii) $d^3u/dx^3 = u$, $u(0)=1$, $u'(0)=-1$, $u''(0)= \pi$

2) Use MATLAB "**dsolve**" command and solve the following systems of initial value differential equations.

$$\begin{cases} \mathbf{f}'(\mathbf{x}) = 3\mathbf{f}(\mathbf{x}) + 4\mathbf{g}(\mathbf{x}) \\ \mathbf{g}'(\mathbf{x}) = -4\mathbf{f}(\mathbf{x}) + 3\mathbf{g}(\mathbf{x}); \quad \mathbf{f}(0) = 0, \mathbf{g}(0) = 1 \end{cases}$$

3) Use "**ode45**" to solve the following differential equation and plot y(x) in the interval of [0, 6π]. Put your name in the plot title.

$$y''(x) - y(x) = 0\ ,\ y(0)=0,\ y'(0)=1$$

4) Use "**ode23**" and "**ode45**" solvers to solve the given set of differential equations and plot the results against each other in interval [0 12]. Put your name in the plot title.

$$\begin{aligned} y_1' &= y_2\, y_3 & y_1(0)&=0 \\ y_2' &= -y_1\, y_3 & y_2(0)&=1 \\ y_3' &= -0.51 y_1\, y_2 & y_3(0)&=1 \end{aligned}$$