Setup of xmaple
for lab work in
Mathematics 5410

1. Start maple with the command xmaple. A window labeled Maple XXX should appear. Size it to 3/4 of the screen.

2. Under Options on the upper menu bar, choose Plot display and then inline.

3. On the second line below the menu bar of xmaple, select the text size for the screen as the second magnifier from the left. This size also affects printouts on the laser printer.

4. Test the setup with the following plot code:
   plot(sin(x),x=0..Pi);
   Warning: pi, PI, Pi are all different in maple. Syntax and case are important.

5. Test the help command with
   ?plot
Example. Plot the solution curves on $t = -2$ to $t = 2$, $y = -3$ to $y = 3$, going through the points $(0,2), (0,0), (0,-2)$ over a direction field on a 10 by 10 grid, for the differential equation $y' = -y + 3t$.

Solution: The maple commands which make the plot appear below. This is basically a typing lesson from the maple documentation for DEtools.

```maple
with(DEtools):
de:=diff(y(t),t)=-y(t)+3*t:
Grid:=dirgrid=[10,10],arrows=medium,thickness=2:
Ivps:=[[y(0)=2],[y(0)=0],[y(0)=-2]]:
Rectangle:=t=-2..2,y=-3..3:
DEplot(de,y(t),Rectangle,Ivps,Grid);
```

If `Ivps` is removed, then the commands produce only a direction field. Plot options `arrows=None, color=BLACK, dirgrid=[15,15]` are useful: find out what they do by experiment.

For the problems below, submit a single printout of a maple worksheet. Label the problems by number in the worksheet. Submit by the end of this week.

Problem 1. Repeat the example for differential equation $y' = y + \cos t$.

Problem 2. Repeat the example for differential equation $y' = \sin(ty)$.

Problem 3. Repeat the example for differential equation $y' = \sin(t + y)$.

Problem 4. Repeat the example for differential equation $y' = \sin(2\pi y/(1 + y^2))$
on the rectangle $t = -5$ to $t = 5$, $y = -2$ to $y = 2$.

Problem 5. Find the equilibrium solutions in Problem 4 above, inside the given rectangle. Check the answer against the maple solver called `fsolve`, which uses this syntax:

```maple
f:=u->sin(2*Pi*u/(1+u^2)):
fsolve(f(u)=0,u,-2..0);
fsolve(f(u)=0,u,0..2);
```