Two Pendula Coupled by a Spring

Setup the initial conditions - both pendula at rest

Define the approximate (small angle) equations of motion and solve for x1[t] and x2[t]

Define the constants to some useful values (weak coupling) and plot both x1 and x2 versus t
In[8]:= plot1 = ParametricPlot[
  Evaluate[{t, x1[t]} /. dsol /. val], {t, 0.1, 50}, PlotStyle \[Rule] RGBColor[0, 0, 1],

In[9]:= plot2 = ParametricPlot[Evaluate[{t, x2[t]} /. dsol /. val], {t, 0.1, 50}, PlotStyle \[Rule] RGBColor[1, 0, 0], GridLines \[Rule] Automatic,