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> #Deven Singh
  #Assignment 22
   # Do not post

> #Q1
   # In class, I was told by Dr. Z I correctly completed every question on the attendance quiz
> #Q2
   #2a
> #Orb2(F,x,y,pt,K1,K2): Inputs a mapping F=[f,g] from R^2  to R^2 where f and g describe
      functions of x and y, an initial point pt0=[x0,y0]
  #outputs the orbit starting at discrete time K1 and ending in discrete time K2. Try
  #F:=RT2(x,y,2,10);
  #Orb2(F,x,y,[1.1,1.2],1000,1010);
  Orb2 := proc(F, x, y, pt0, K1, K2)  local pt, L, i :
  pt := pt0 :

  for i from 1 to K1 do
  pt := subs({x = pt[1], y = pt[2]}, F) :
  od:

  L := [ ] :
  for i from K1 + 1 to K2 do
  L := [op(L), pt] :
  pt := subs({x = pt[1], y = pt[2]}, F) :

  od:
  L :
  end:
>  Orb2([2·x + 3·y, 3·x + y], x, y, [20, 10], 0, 10);
[[20, 10], [70, 70], [350, 280], [1540, 1330], [7070, 5950], [31990, 27160], [145460, 123130],   (1)
    [660310, 559510], [2999150, 2540440], [13619620, 11537890]]
>  # 13,619,620 lynxes and 11,537,890 hares
>  help(dsolve);
> #Dis2(F,x,y,pt,h,A): The approximate orbit of the Dynamical system approximating the 2D for the
      autonomous  continuous dynamical  process
  #dx/dt=F[1](x(t),y(t))
  #dy/dt=F[2](x(t),y(t)) , x(0)=pt[1], y(0)=pt[2] with mesh size h from t=0 to t=A
  Dis2 := proc(F, x, y, pt, h, A) local L, i :

  L := Orb2([x + h * F[1], y + h * F[2]], x, y, pt, 0, trunc(A / h)) :

  L := [seq([i * h, [L[i][1], L[i][2]]], i = 1 ..nops(L))] :
  end:
>  Dis2([2·x + 3·y, 3·x + y], x, y, [20, 10], 1, 10);
[[1, [20, 10]], [2, [90, 80]], [3, [510, 430]], [4, [2820, 2390]], [5, [15630, 13240]], [6,      (2)
    [86610, 73370]], [7, [479940, 406570]], [8, [2659530, 2252960]], [9, [14737470,
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12484510]], [10, [81665940, 69181430]]]
> # 81,665,940 lynxes and 69,181,430 hares
> # Will make up 3,4,5
>
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