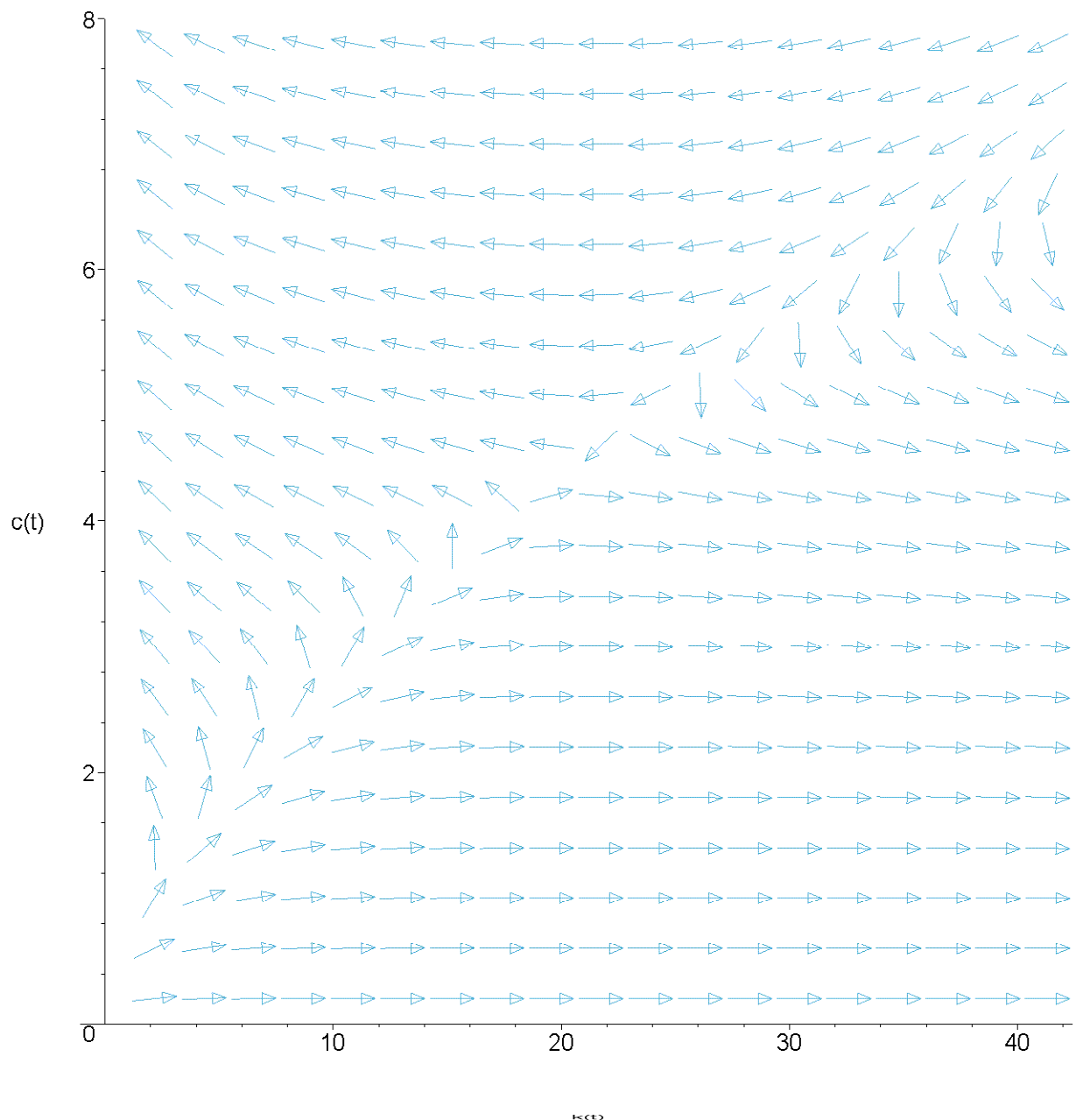


```

[ > restart:
[ #Set Options and Preferences
[ > with (plots) :
[ > axesfonts:=axesfont=[TIMES,ROMAN,8]:
[ > labelfonts:=labelfont=[TIMES,ROMAN,10]:
[ > webblue:=COLOR(RGB,.1,0,.55):
[ > webred:=COLOR(RGB,.9,.1,0):
[ > webgreen:=COLOR(RGB,.0,.5,.0):
[ > lightblue:=COLOR(RGB,0.196,0.6,0.8):
[ #Parameter Assignments
[ > A:=1: a:=0.5: d:=0.05: n:=0.01: g:=0.02: s:=1/2: rho:=0.02:
[ #Function Definitions
[ > f := k-> A*k^(a):
[ > fk := k-> A*a*k^(a-1):
[ > y := k-> f(k)-(d+n+g/s):
[ > yk := k-> fk(k)-(d+g/s):
[ #The Dynamic System
[ > kdot := diff(k(t),t) = y(k(t))-c(t):
[ > cdot := diff(c(t),t) = c(t)*s*(yk(k(t))-rho):
[ #Solving for a Stationary State (SS)
[ > eqk := eval(kdot,{k(t)=k,c(t)=c}):
[ > eqc := eval(cdot,{k(t)=k,c(t)=c}):
[ > systemss:=fsolve({eqk,eqc},{k,c},c=0.01..1000):
[ > kss:=subs(systemss,k): kss:
[ > css:=subs(systemss,c): css:
[ > kmin:=0: kmax:=2*kss: cmin:=0: cmax:=1.8*css:    The range can be
[   tweaked to change viewing perspective
[ #Simulating the Dynamics
[ > FNS:={k(t),c(t)}:
[ > SYS:={kdot,cdot}:
[ > DEtools[dfieldplot](SYS, FNS, t=0..100, scene=[k(t),c(t)],
[   k=kmin..kmax, c=0.2+cmin..cmax-0.2, stepsize=.05,
[   colour=lightblue, arrows=SLIM);

```



```
[ #Adding Nullclines to the Phase Diagram
```

```
> nullcline_consumption:=plot({y(k)},k=kmin..kmax,color=black,thickness=2):
```

```
> nullcline_capital:=CURVES([[kss,0],[kss,cmax]], THICKNESS(2)):
```

```
> nullclines:=nullcline_consumption,nullcline_capital:
```

```
[ #Plotting the Stable Manifold
```

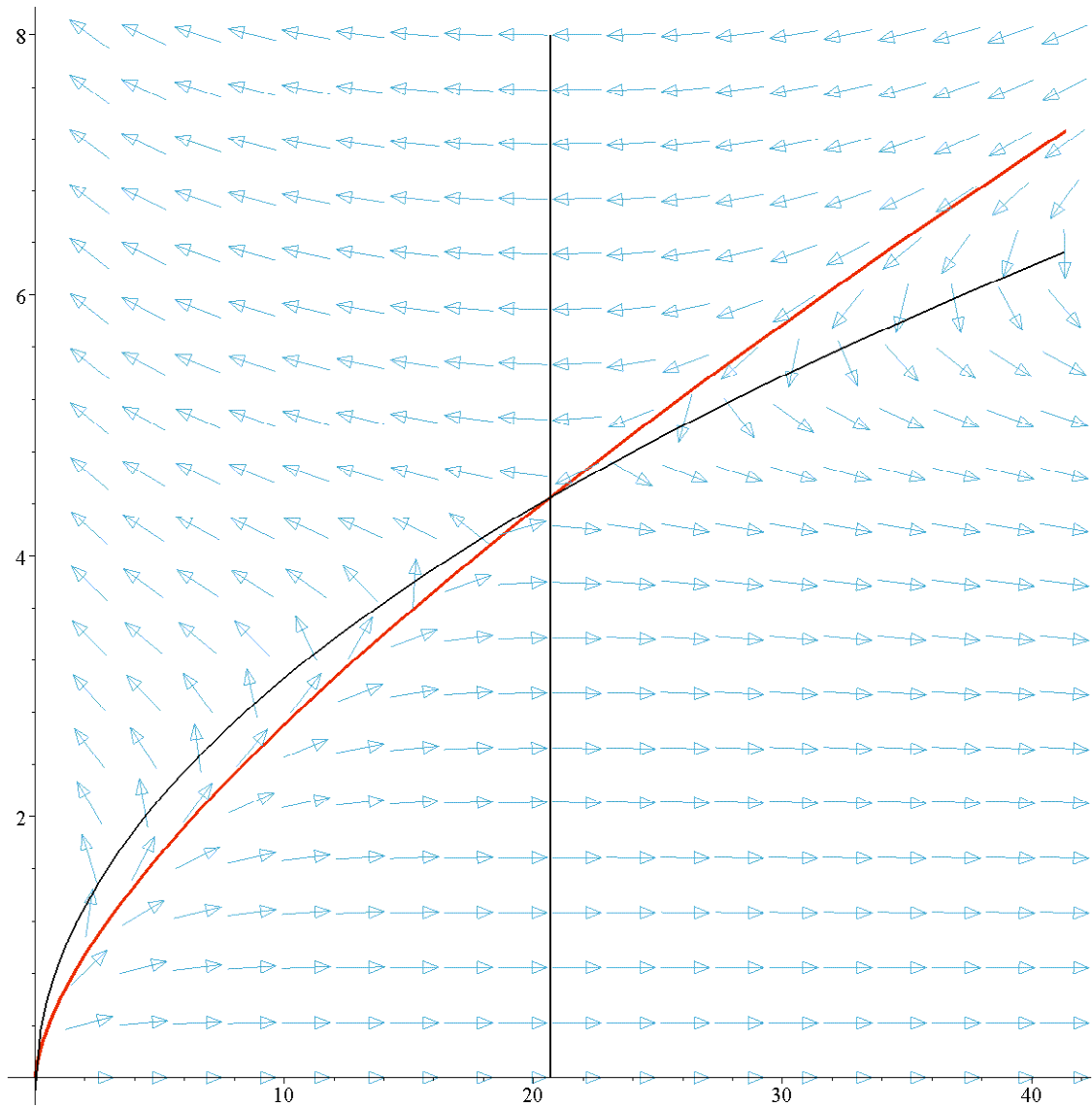
```
> INITS:=
```

```
[[k(0)=0.99999*kss,c(0)=0.99999*css],[k(0)=1.0001*kss,c(0)=1.0001*css]]:
```

```
> phase:=DEtools[phaseportrait](SYS, FNS, t=-300..0, INITS, scene=[k(t),c(t)], k=kmin..kmax, c=cmin..cmax, stepsize=0.5, colour=lightblue, arrows=slim, linestyle=1, linecolour=webred, thickness=4, axesfonts, labelfonts):
```

```
display({phase,nullclines}, title='The stable manifold, the nullclines, and the Phase Diagram of the Ramsey-Solow model');
```

The stable manifold, the nullclines, and the Phase Diagram of the Ramsey-Solow model



```

> plotsetup (ps,plotoutput=`Ramsey_Phase_color.ps`,plotoptions=`color,portrait,noborder,axiswidth=500pt,axisheight=500pt`):
display ({phase,nullclines},view=[kmin..kmax,cmin..cmax],labels=[
``,``],axesfonts,labelfonts); plotsetup (default):
> plotsetup (ps,plotoutput=`Ramsey_Phase.ps`,plotoptions=`nocolor,portrait,noborder,axiswidth=500pt,axisheight=500pt`):
display ({phase,nullclines},view=[kmin..kmax,cmin..cmax],labels=[
``,``],axesfonts,labelfonts); plotsetup (default):
[ >
[ >
[ >

```