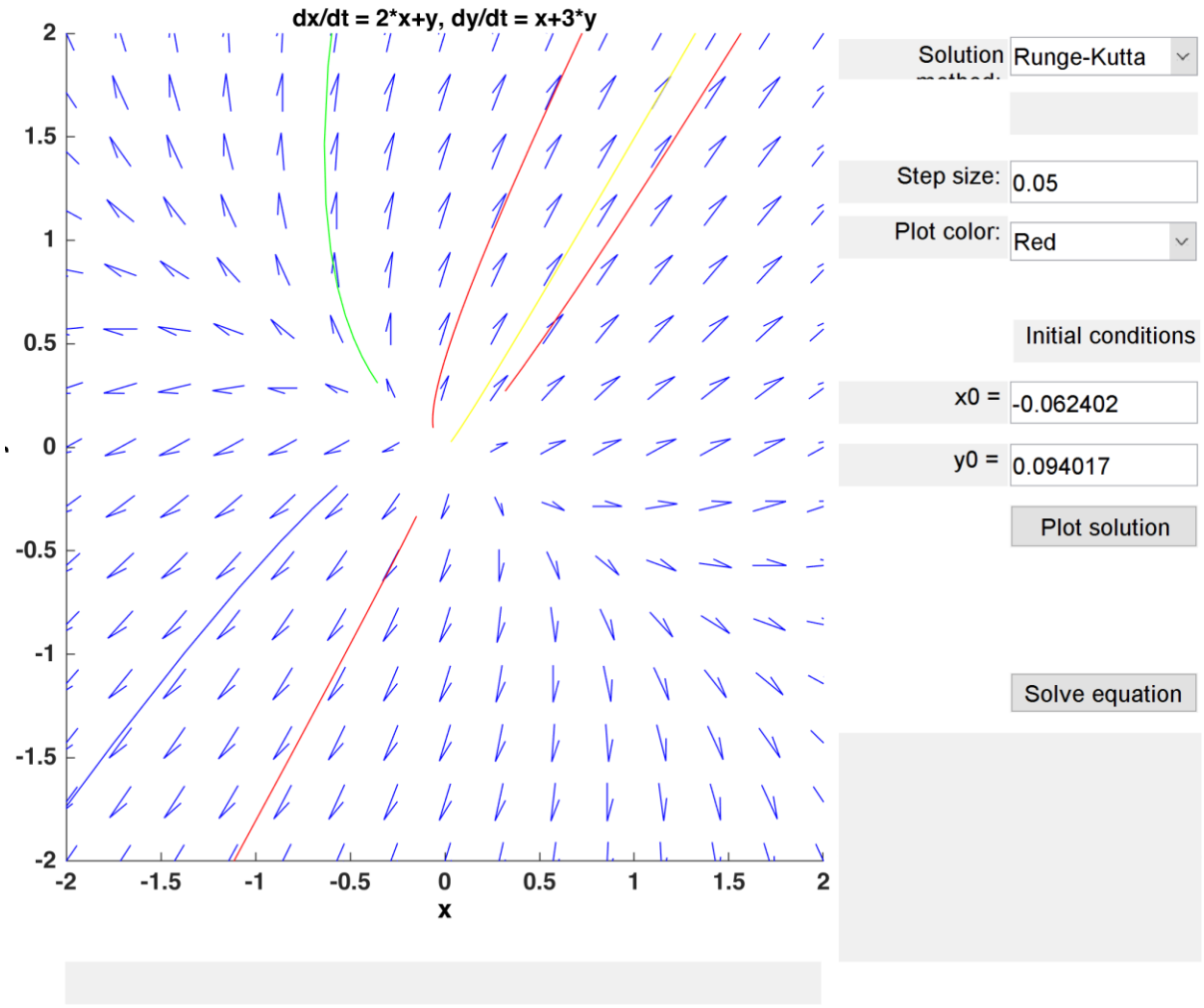
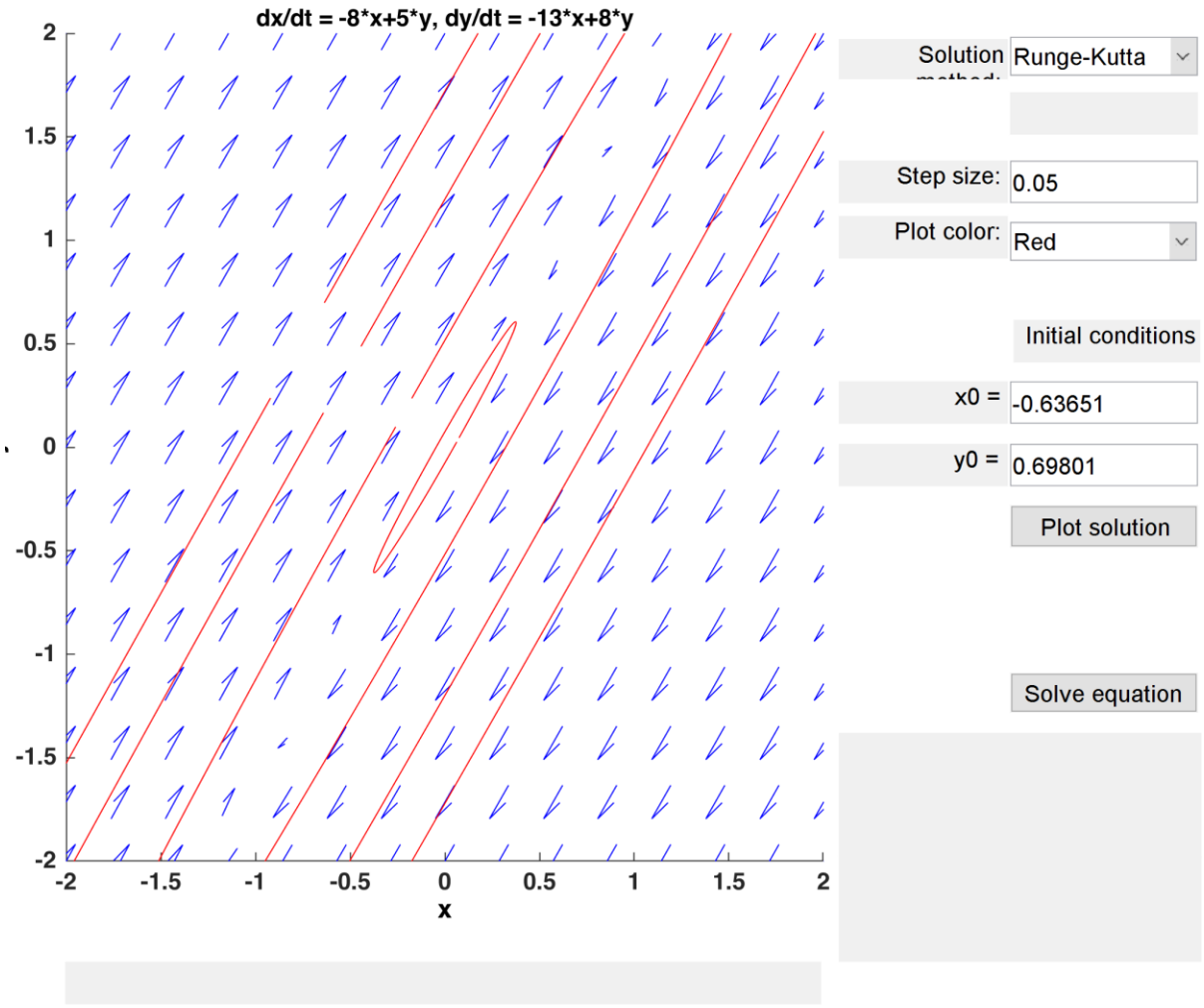
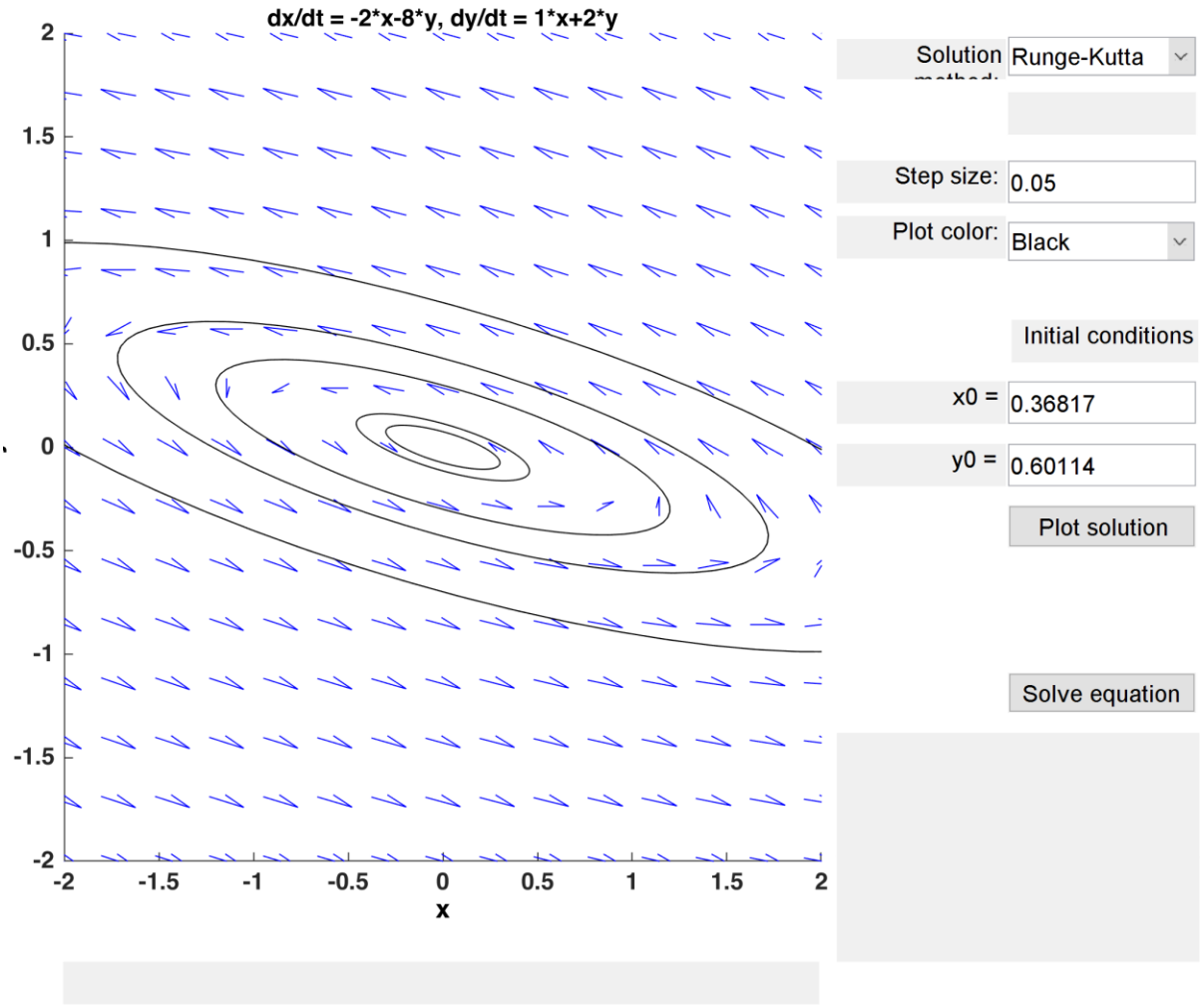


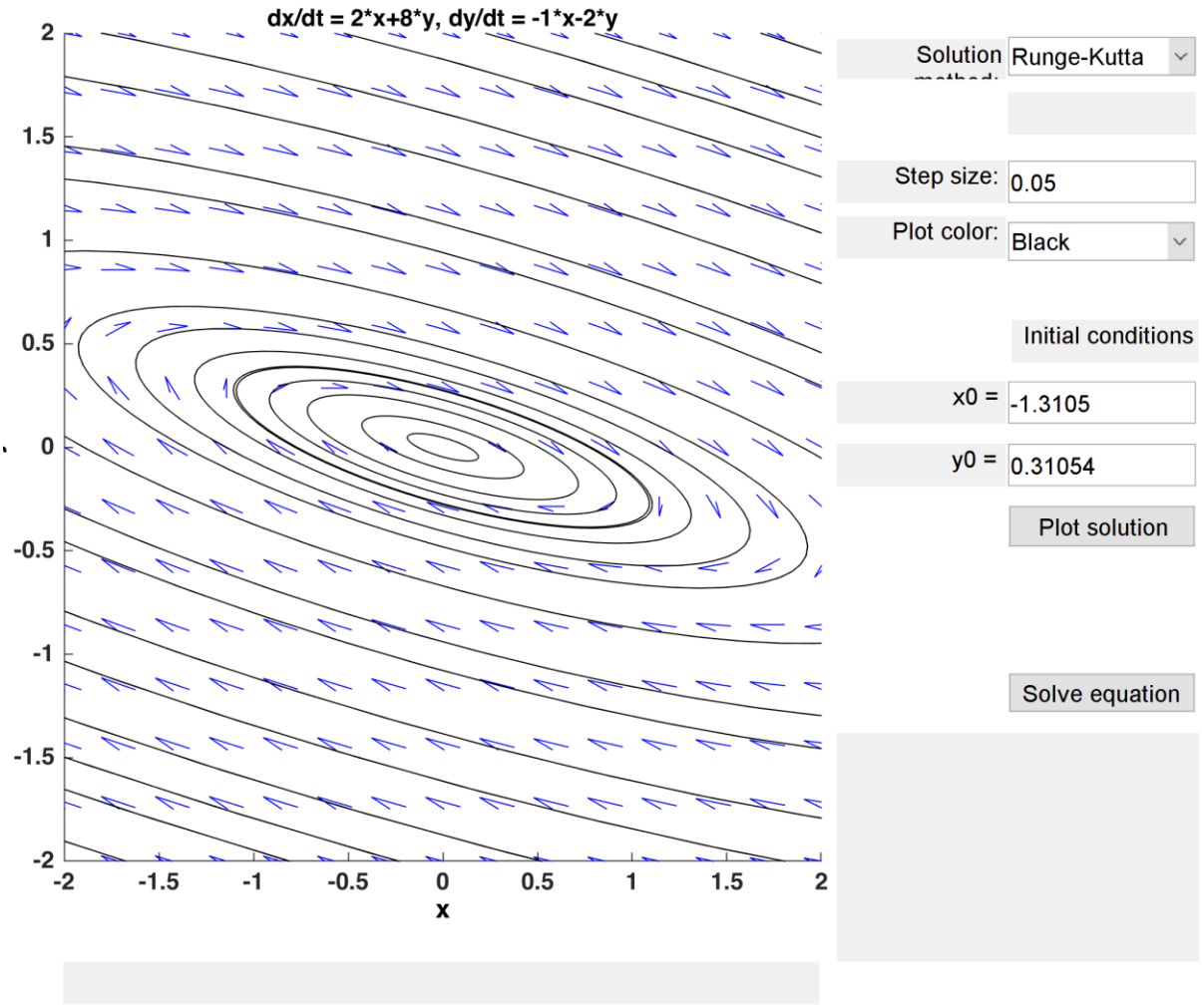

```
% 4.1. |dx/dt = [2 1; 1 3] x|
%   Plot: plot4.1.png
%   Stability: Unstable Nodal Source
%   Eigenvalues: [5+/-sqrt(5)]/2
%   Based on table 3.5.1, since $${\lambda}1$>
$${\lambda}2$ >0, it is an unstable node.
```



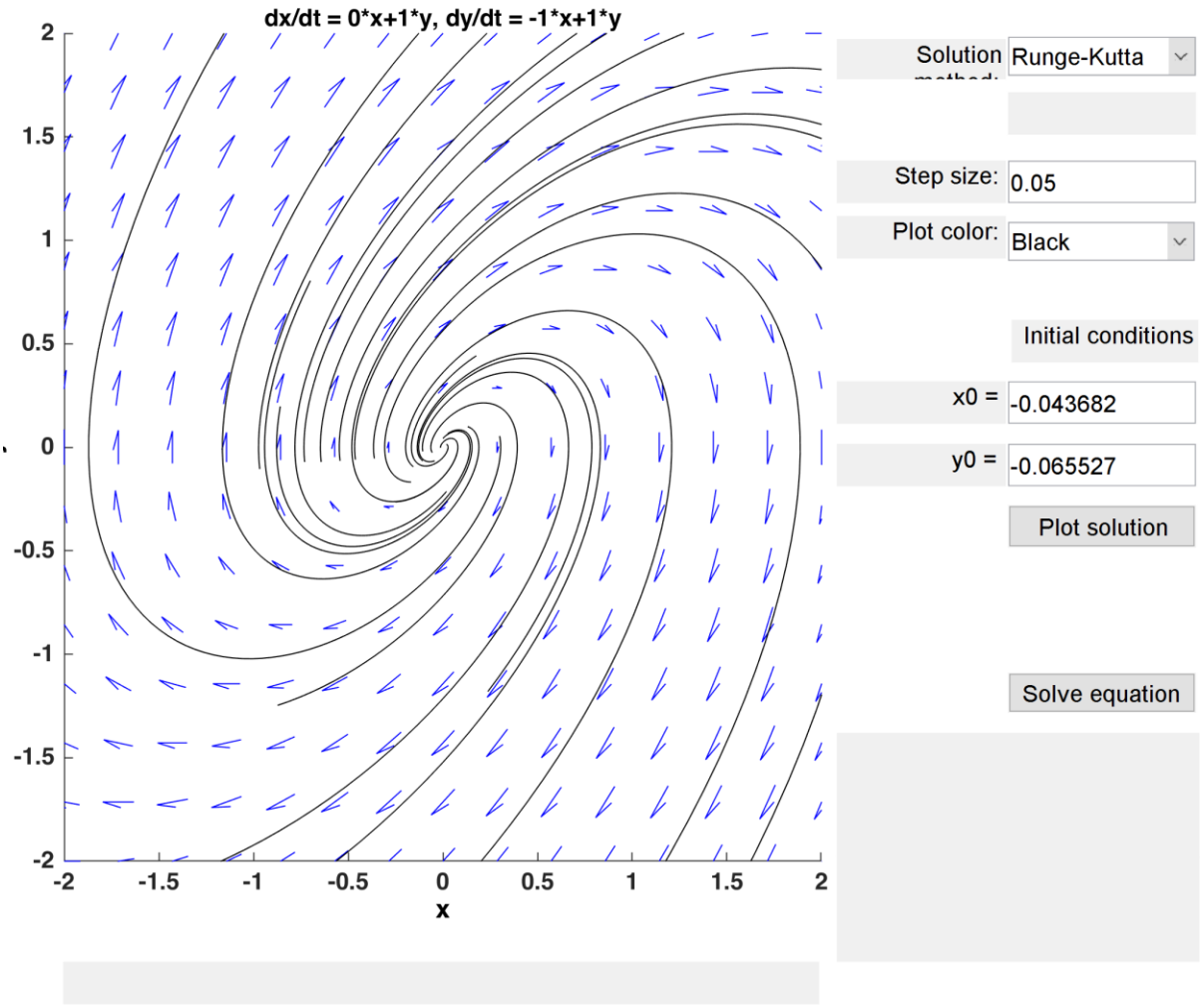

```
% 4.2. |dx/dt = [-2 -1; -1 -3] x|
%   Plot: plot4.2.png
%   Stability: Stable Nodal Sink
%   Eigenvalues: [-5+/-sqrt(5)]/2
%   Based on table 3.5.1, since $${\lambda}1$<
$${\lambda}2$ <0, it is a stable node.
%
```



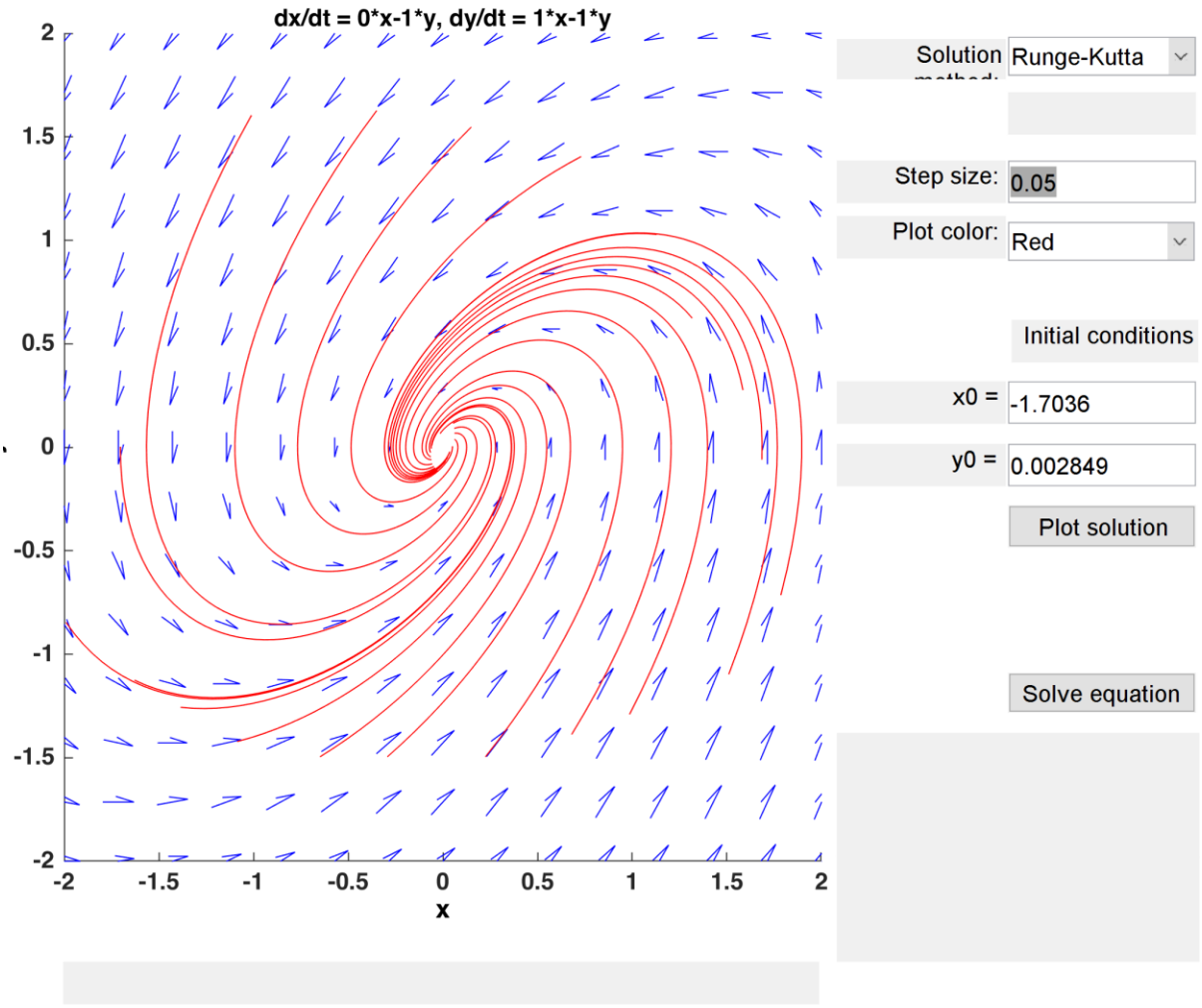

```
% 4.3. |dx/dt = [-4 -6; 3 5] x|
%   Plot: plot4.3.png
%   Stability: Unstable Saddle Point,
counterclockwise
%   Eigenvalues: 2, -1
%   Based on table 3.5.1, since $${\lambda}1$>0>
$${\lambda}2$ , it is an unstable saddle point.
```



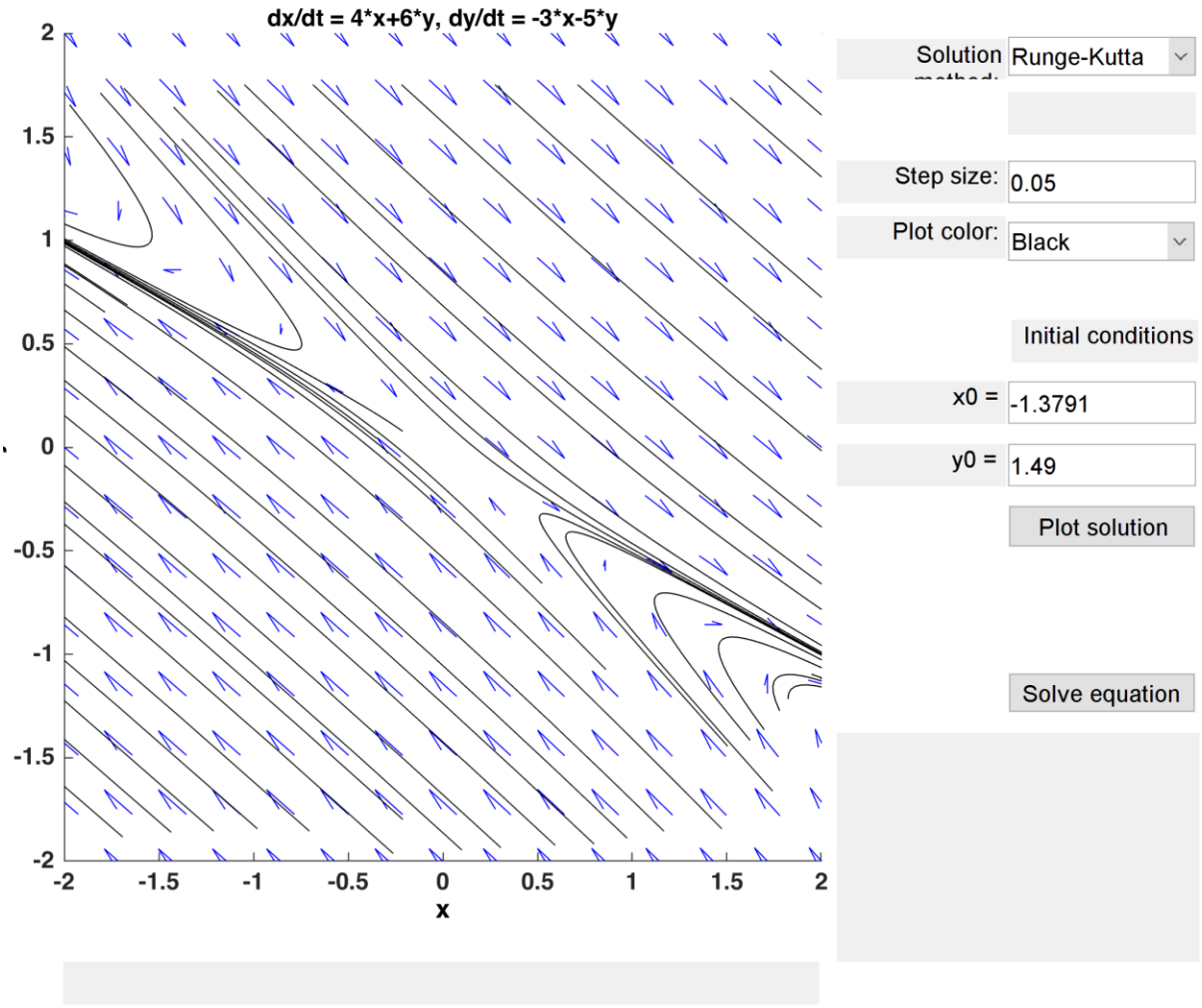

```
% 4.4. |dx/dt = [4  6; -3 -5] x|
%   Plot: plot4.4.png
%   Stability: Unstable Saddle Point, Clockwise
%   Eigenvalues: 1, -2
%   Based on table 3.5.1, since $${\lambda}1$>0>
$${\lambda}2$ , it is an unstable saddle point.
```



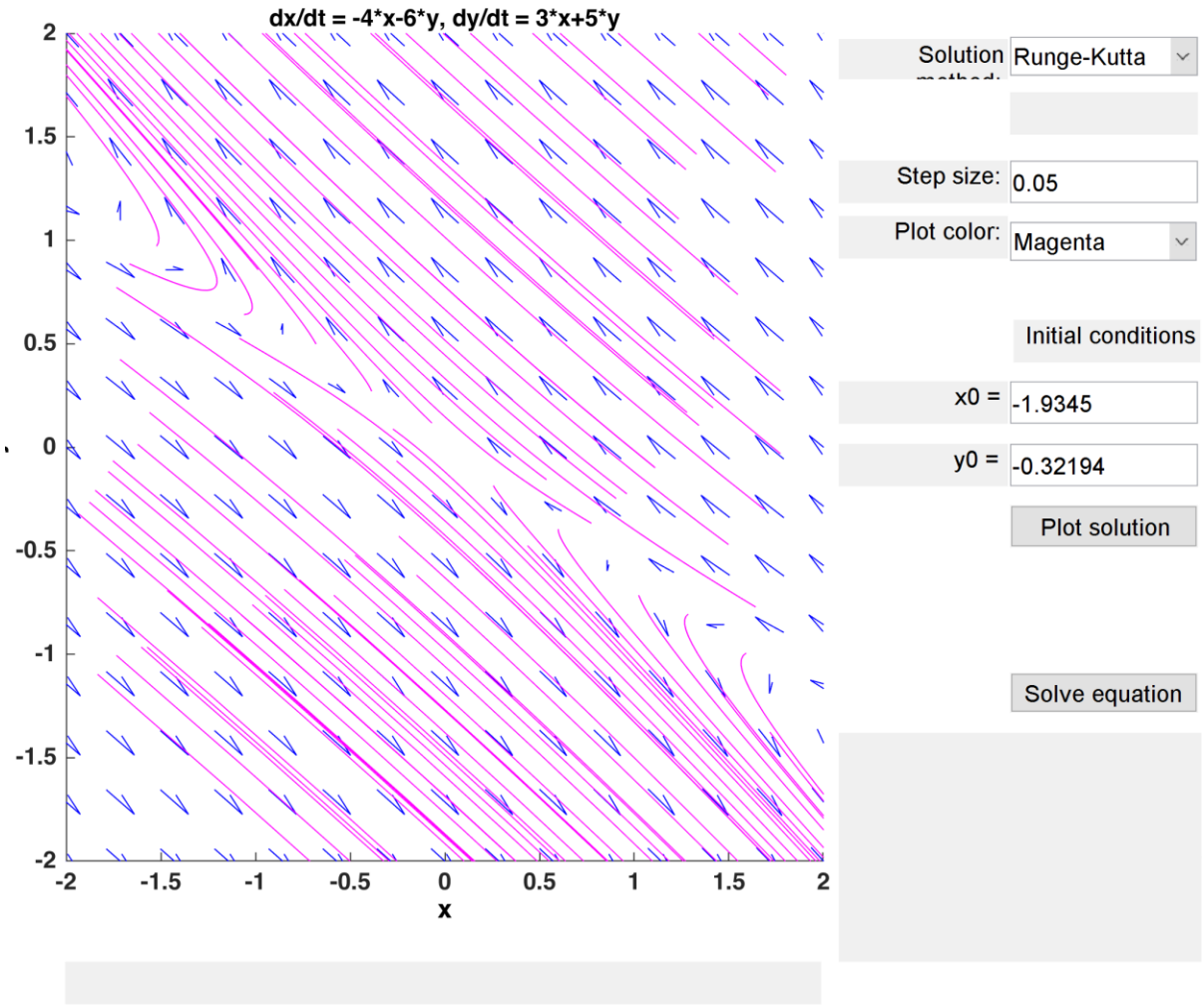

```
% 4.5. |dx/dt = [0  -1; 1 -1] x|
%   Plot: plot4.5.png
%   Stability: Spiral Sink, Counterclockwise
%   Eigenvalues: -1/2 +/- i*sqrt(3)/2
%   Based on table 3.5.1, since $${\lambda}1$,
$${\lambda}2$ = $${\mu}$ ± i $${\lambda}$, it is a
spiral point.
%
%
%
%   since $${\lambda}$ < 0, it is asymptotically
stable.
```



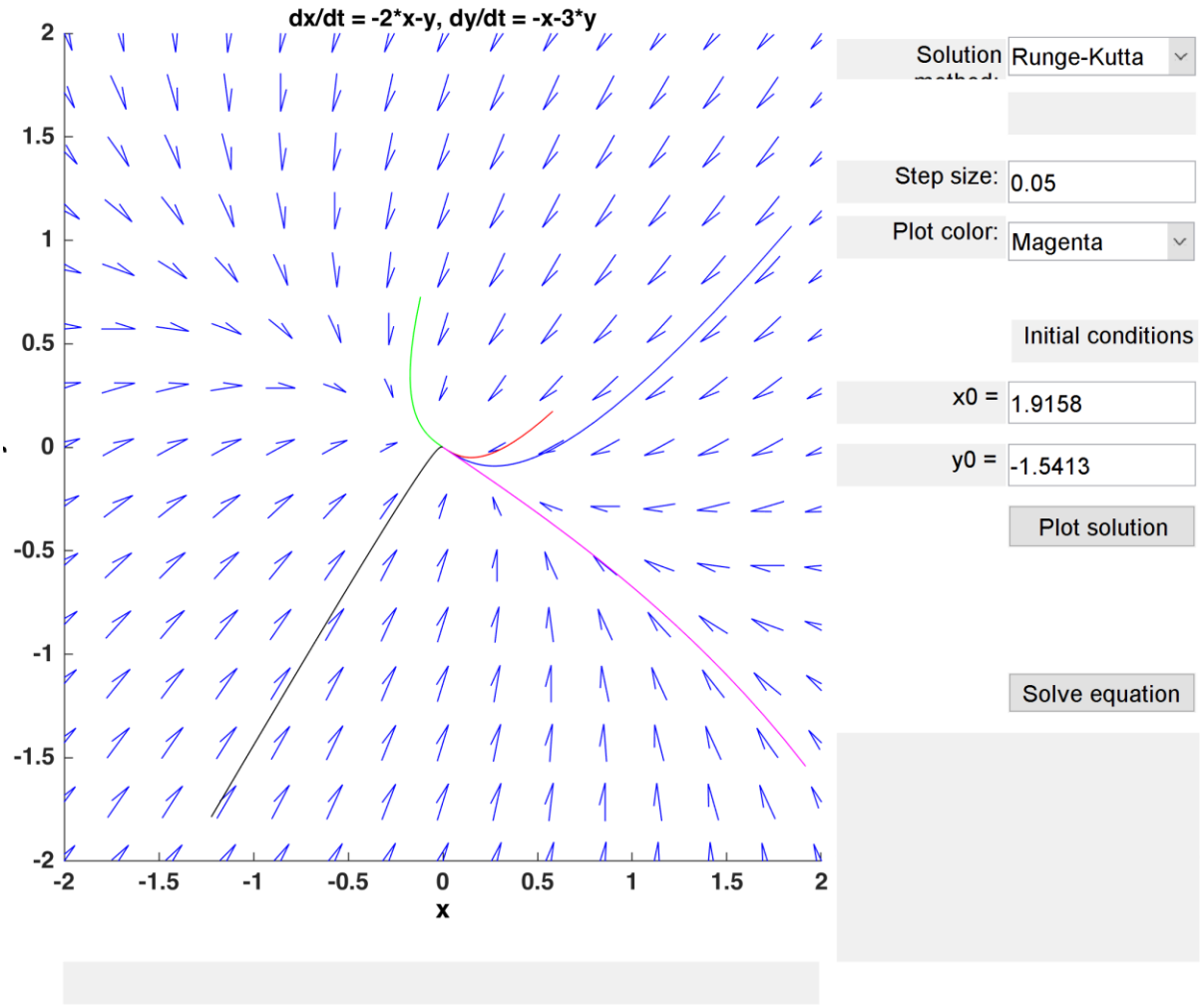

```
% 4.6. |dx/dt = [0  1; -1 1] x|
%   Plot: plot4.6.png
%   Stability: Spiral Source, clockwise
%   Eigenvalues: 1/2 +/- i*sqrt(3)/2
%   Based on table 3.5.1, since $${\lambda}1$,
$${\lambda}2$ = $${\mu}$ ± i $${\lambda}$, it is a
spiral point.
%   since $${\lambda}$ > 0, it is unstable.
```



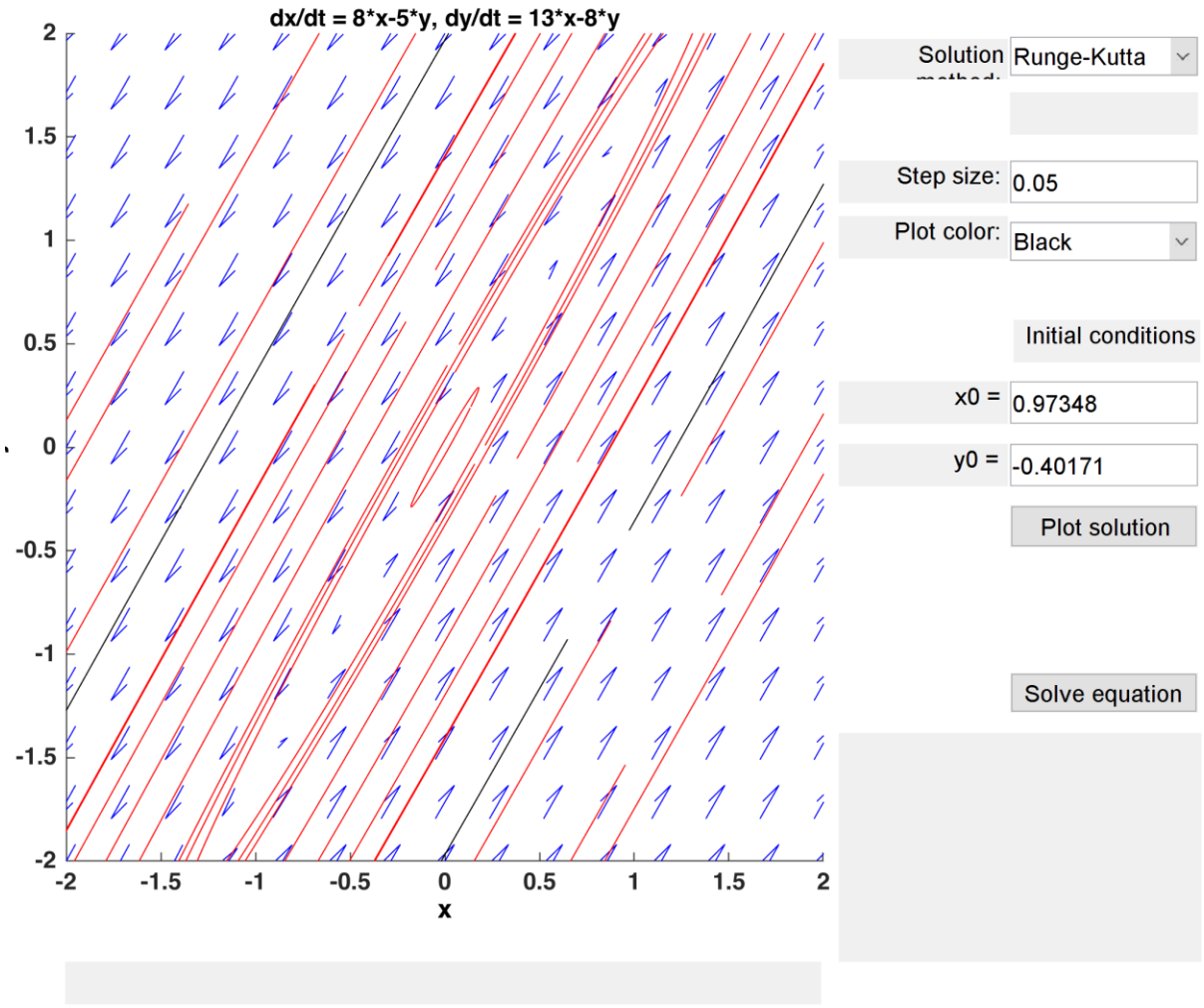

```
% 4.7. |dx/dt = [2  8; -1 -2] x|
%   Plot: plot4.7.png
%   Stability: Stable Centre, Clockwise
%   Eigenvalues: +/- 2i
%   Based on the table 3.5.1, since $${\lambda}1$ =
i $${\lambda}$ ,  $${\lambda}2$  = - i $${\nu}$, it
is a stable
%   centre.
```




```
% 4.8. |dx/dt = [-2 -8; 1 2] x|
%   Plot: plot4.8.png
%   Stability: Stable Centre, Counterclockwise
%   Eigenvalues: +/- 2i
%   Based on the table 3.5.1, since $${\lambda}1$ =
i $${\lambda}$ ,  $${\lambda}2$  = - i $${\nu}$, it
is a stable
%   centre.
```




```
% 4.9. |dx/dt = [-8 5; -13 8] x|
%   Plot: plot4.9.png
%   Stability: Stable Centre, Clockwise
%   Eigenvalues: +/- i
%   Based on the table 3.5.1, since $${\lambda}1$ =
i $${\nu}$,  $${\lambda}2$  = - i $${\nu}$, it is a
stable
%   centre.
```




```
% 4.10. |dx/dt = [8 -5; 13 -8] x|
%   Plot: plot4.10.png
%   Stability: Stable Centre, Counterclockwise
%   Eigenvalues: +/- i
%   Based on the table 3.5.1, since $${\lambda}1$ =
i $${\nu}$,  $${\lambda}2$  = - i $${\nu}$, it is a
stable
%   centre.
```