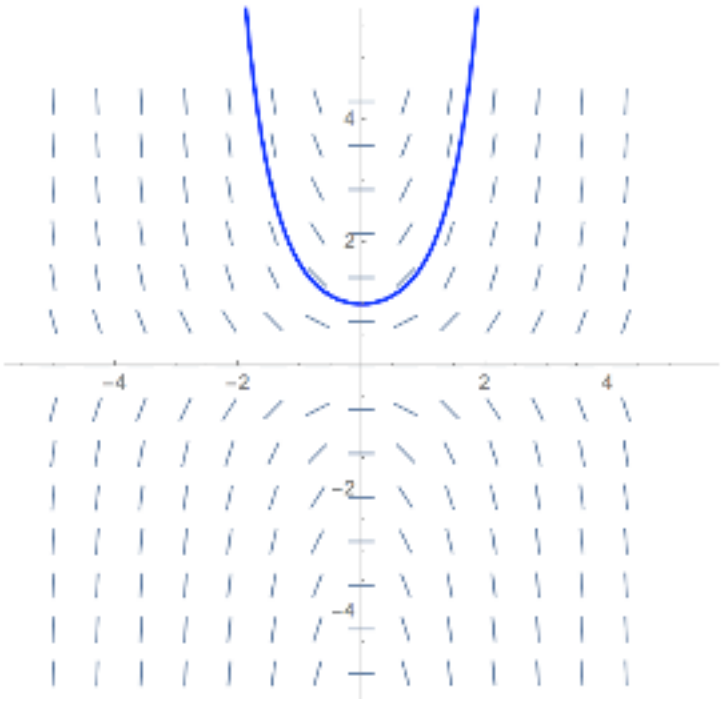
Plotting Slope Fields in Mathematica

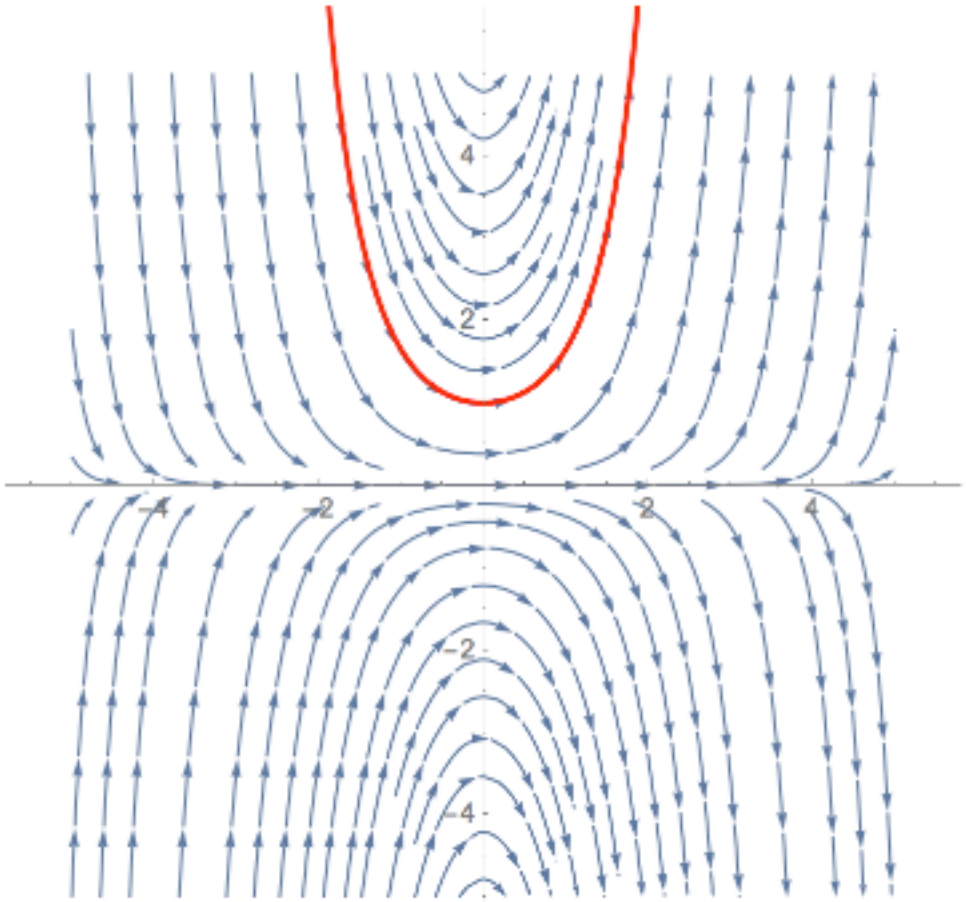
```
In[21]:= Show[VectorPlot[{1, (x * y)}, {x, -5, 5}, {y, -5, 5},
    VectorScale → {.03, .03, None}],
   Plot[Exp[0.5 * x^2], {x, -5, 5}, PlotStyle → {Thick, Blue}],
   Frame → False, Axes → True]
```

Out[21]=



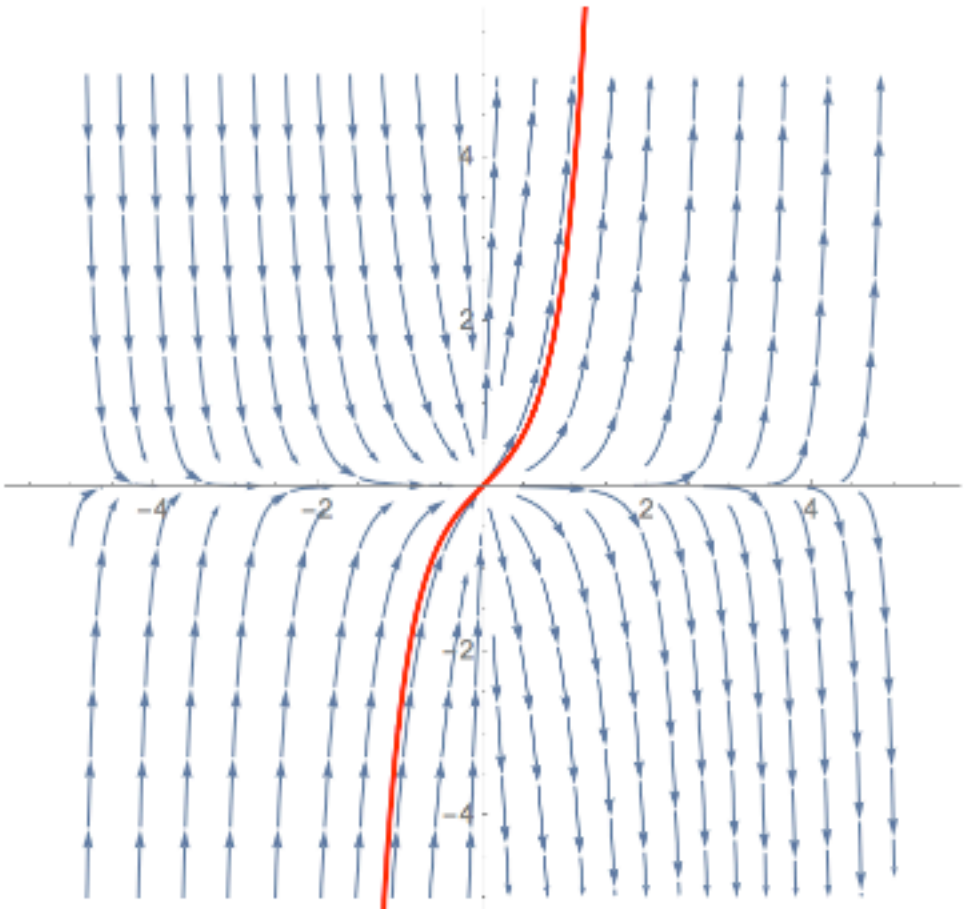
In[31]:=
```
Show[StreamPlot[{1, (x * y)}, {x, -5, 5}, {y, -5, 5},
  VectorScale → {.03, .03, None}], Plot[
  Exp[(1 / 2) * x^2], {x, -5, 5}, PlotStyle → {Thick, Red}],
 Frame → False, Axes → True]
```

Out[31]=



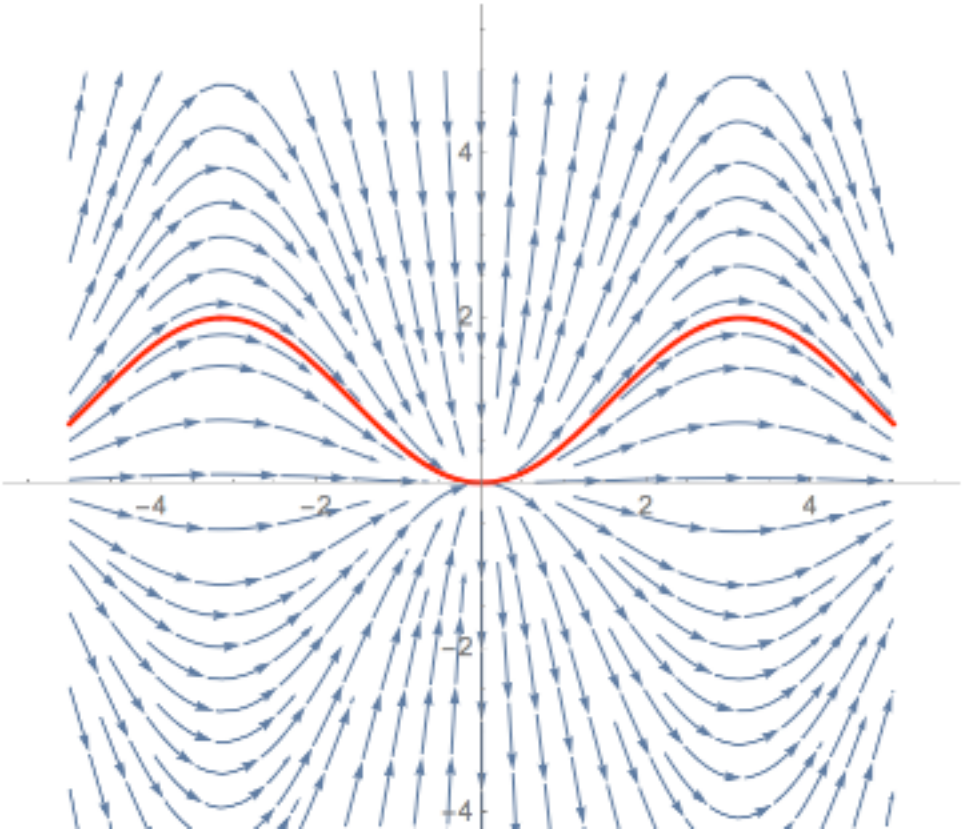
In[32]:=
```
Show[StreamPlot[{1, (1 / x + 2 * x) * y}, {x, -5, 5}, {y, -5, 5},
  VectorScale → {.03, .03, None}], Plot[
  x * Exp[x^2], {x, -5, 5}, PlotStyle → {Thick, Red}],
 Frame → False, Axes → True]
```

Out[32]=



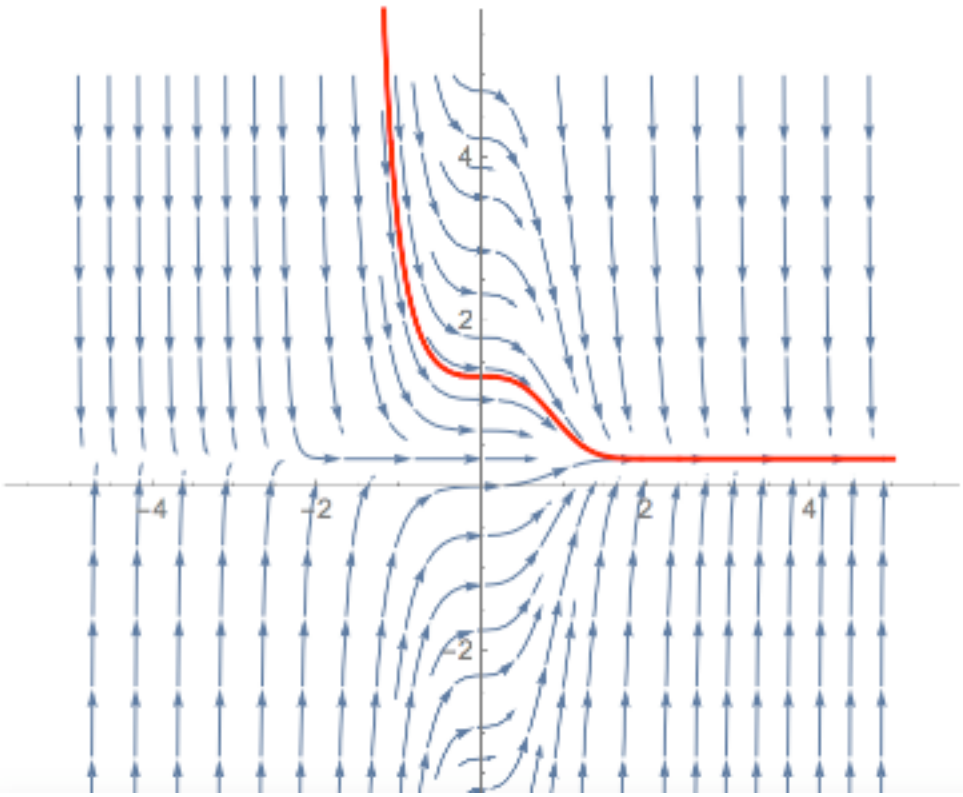
In[30]:=
```
Show[StreamPlot[{1, (Sin[x] * y) / (1 - Cos[x])}, {x, -5, 5},
  {y, -5, 5},
  VectorScale → {.03, .03, None}], Plot[
  1 - Cos[x], {x, -5, 5}, PlotStyle → {Thick, Red}],
 Frame → False, Axes → True]
```

Out[30]=



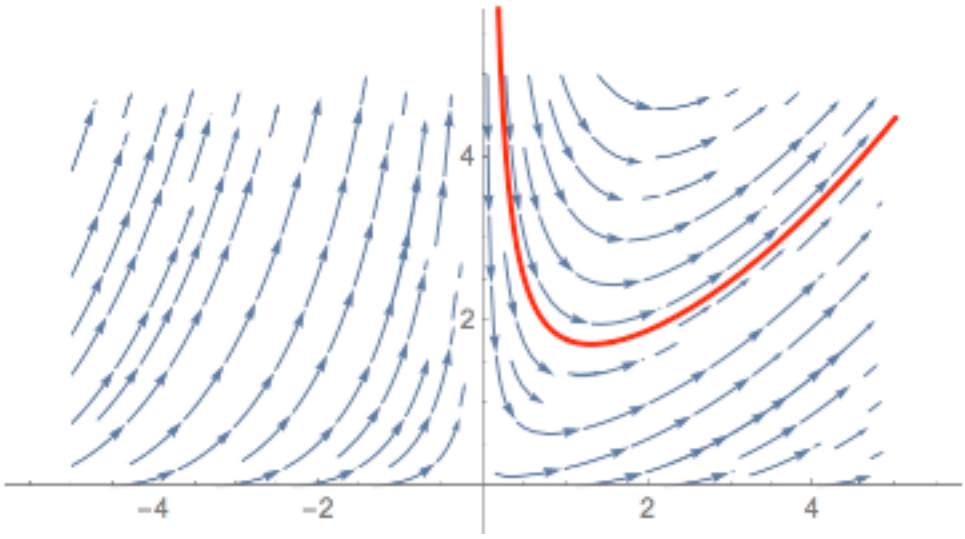
In[33]:=
```
Show[StreamPlot[{1, x^2 - 3 x^2 y}, {x, -5, 5}, {y, -5, 5},
  VectorScale → {.03, .03, None}], Plot[
  1/3 + e^-x^3, {x, -5, 5}, PlotStyle → {Thick, Red}],
 Frame → False, Axes → True]
```

Out[33]=



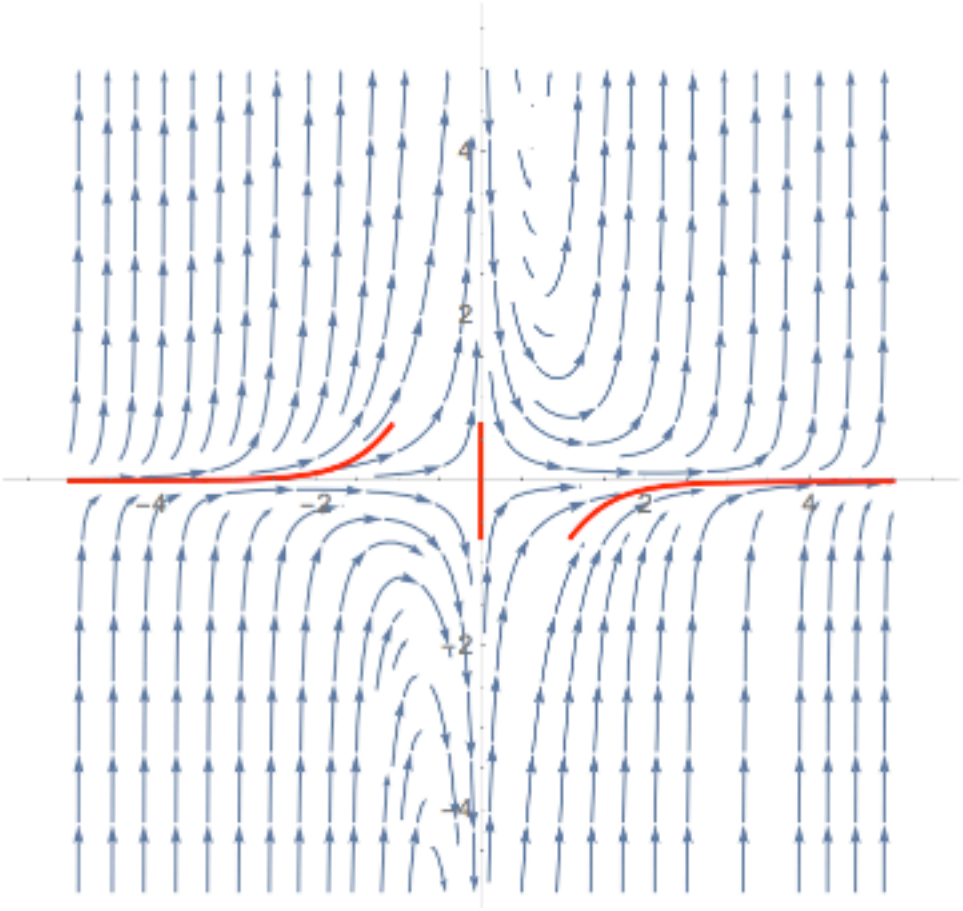
In[27]:=
```
Show[StreamPlot[{1, Sqrt[y] - y/x}, {x, -5, 5}, {y, -5, 5},
  VectorScale -> {.03, .03, None}], Plot[
  ((1 / 3) * x + x^(-1 / 2))^2, {x, -5, 5}, PlotStyle -> {Thick, Red}],
 Frame -> False, Axes -> True]
```

Out[27]=



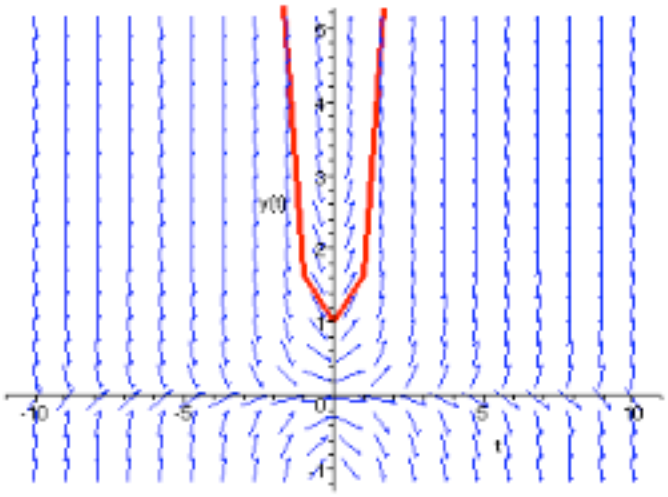
In[29]:=
```
Show[StreamPlot[{1, x^2 * y^2 - y / x}, {x, -5, 5}, {y, -5, 5},
  VectorScale → {.03, .03, None}], Plot[
  -1 / (x + .25 * x^5), {x, -5, 5}, PlotStyle → {Thick, Red}],
 Frame → False, Axes → True]
```

Out[29]=

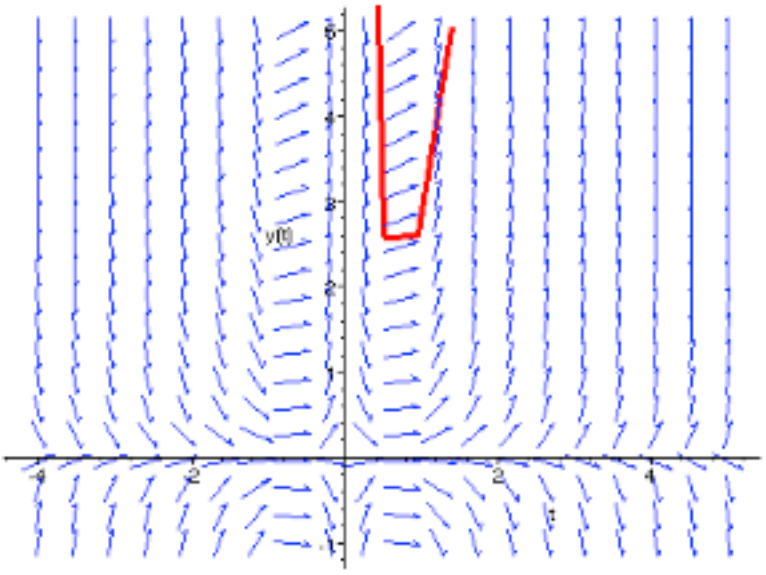


Plotting Slope Fields in Maple

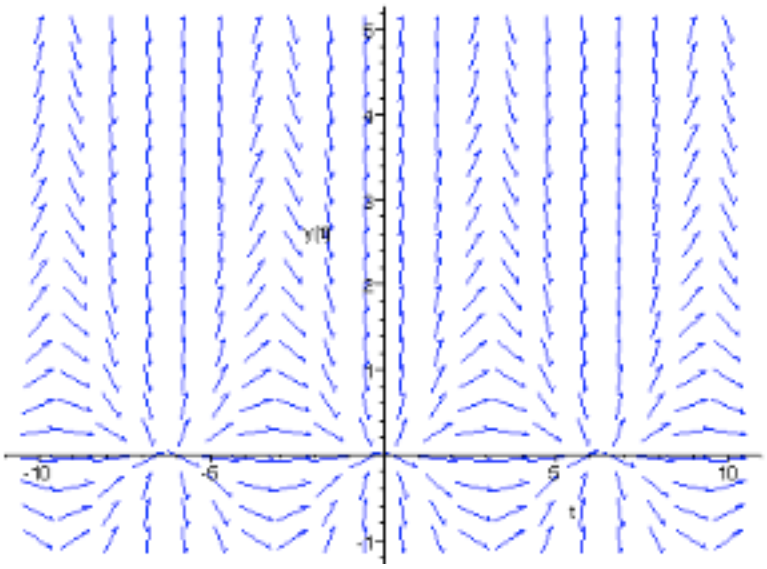
```
> with(DEtools):
> eq := diff(y(t), t) = y(t)*t:
  DEplot(eq, y(t), t = -10 .. 10, [ [y(0) = 1]],  y = -1 .. 5, color = blue, linecolor = red);
```



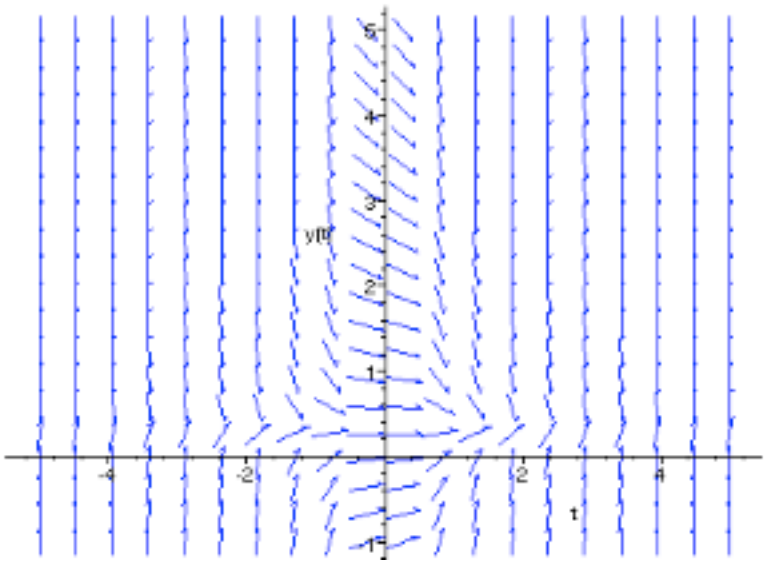

```
eq := diff(y(t), t) = 2*t*y(t)-y(t)/t:
DEplot(eq, y(t), t = -4.. 5, [ [y(1) = exp(1)]],  y = -1 .. 5, color = blue, linecolor = red);
```



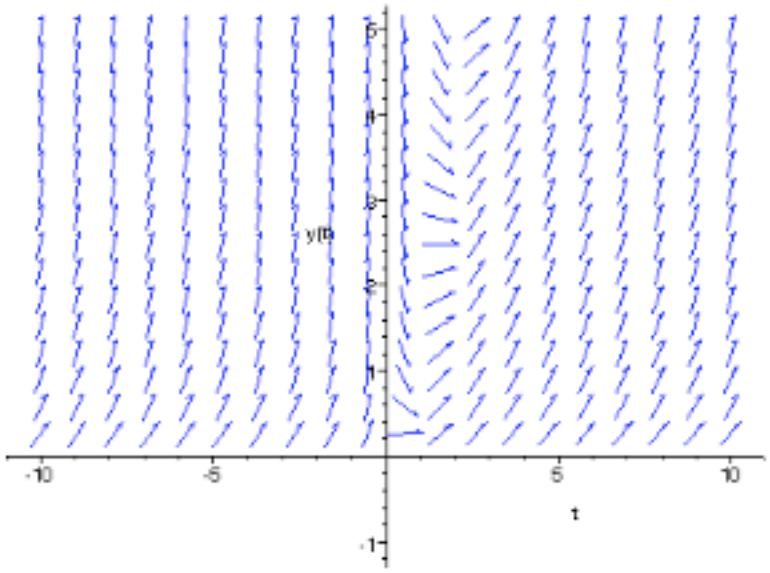
```
eq := diff(y(t), t) = (y(t)*sin(t))/(1-cos(t)):
DEplot(eq, y(t), t = -10 .. 10,   y = -1 .. 5, color = blue, linecolor = red);
```



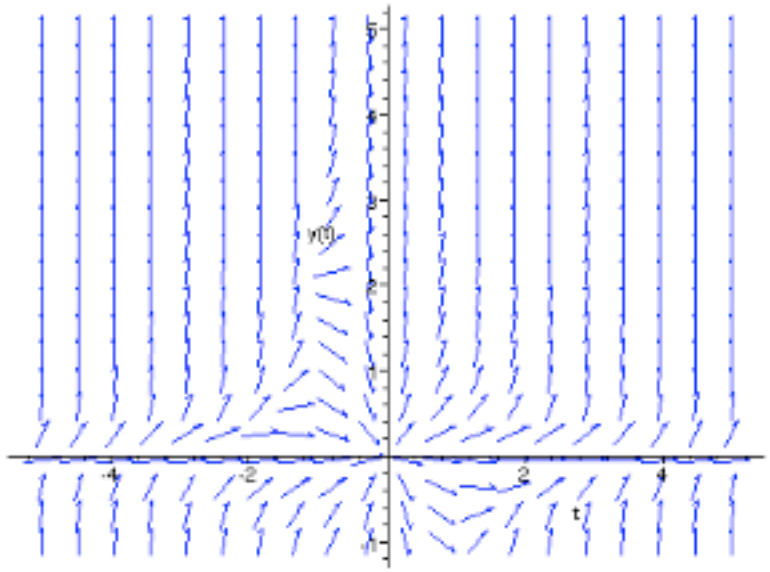

```
eq := diff(y(t), t) = (t^2-3*t^2*y(t)):
DEplot(eq, y(t), t = -5 .. 5,   y = -1 .. 5, color = blue, linecolor = red);
```



```
eq := diff(y(t), t) = (sqrt(y(t))-y(t)/t):
DEplot(eq, y(t), t = -10 .. 10,   y = -1 .. 5, color = blue, linecolor = red):
```

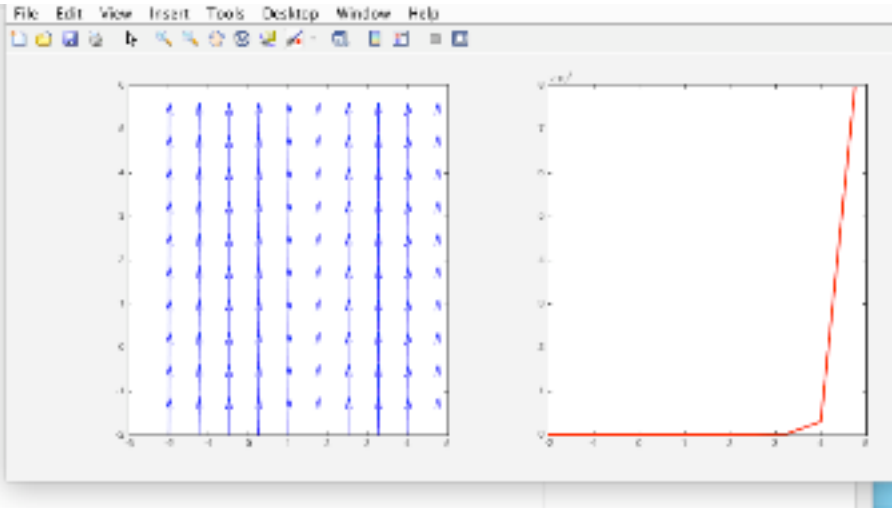


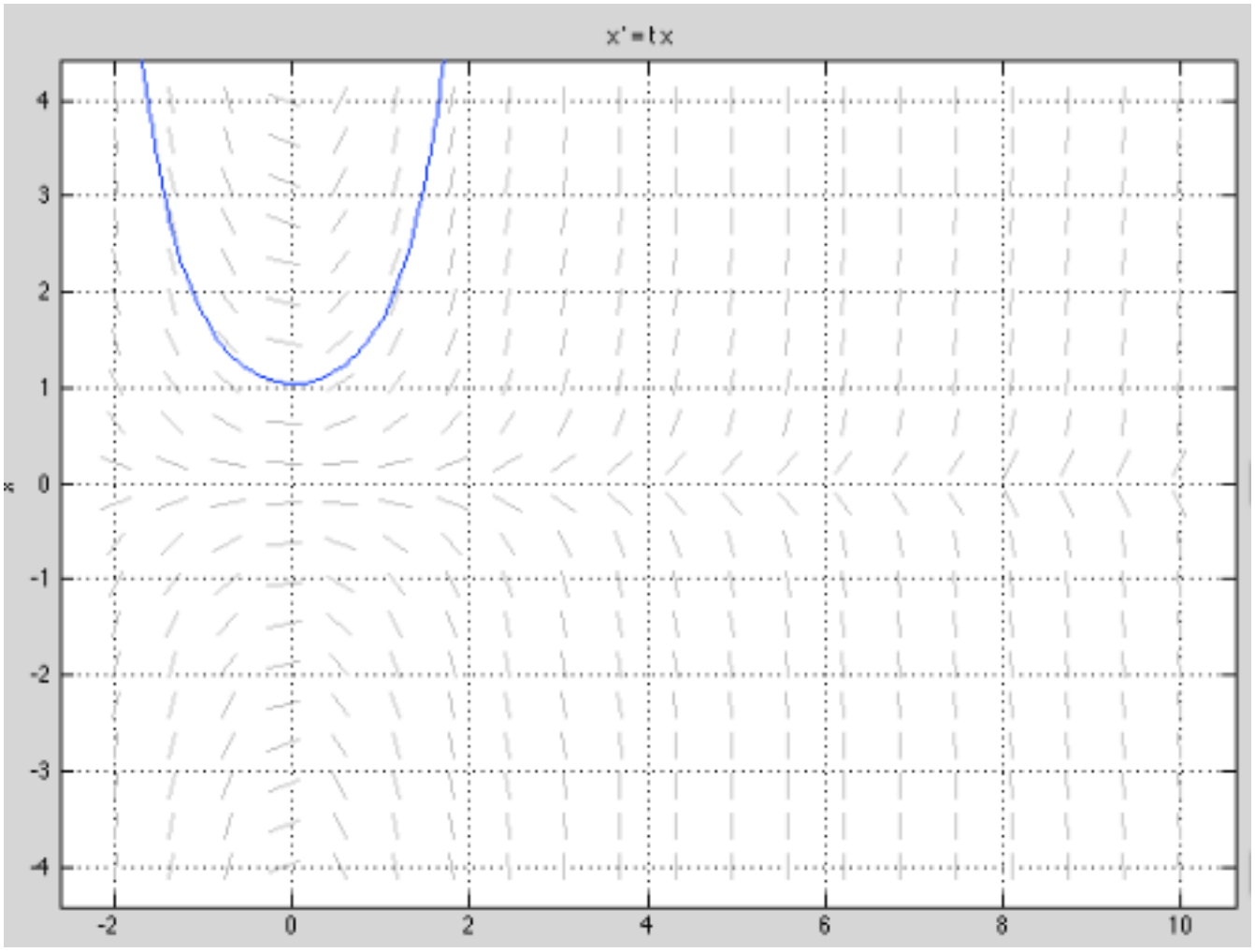

```
eq := diff(y(t), t) = (t^2*(y(t))^2+y(t)/t):
DEplot(eq, y(t), t = -5 .. 5,   y = -1 .. 5, color = blue, linecolor = red):
```

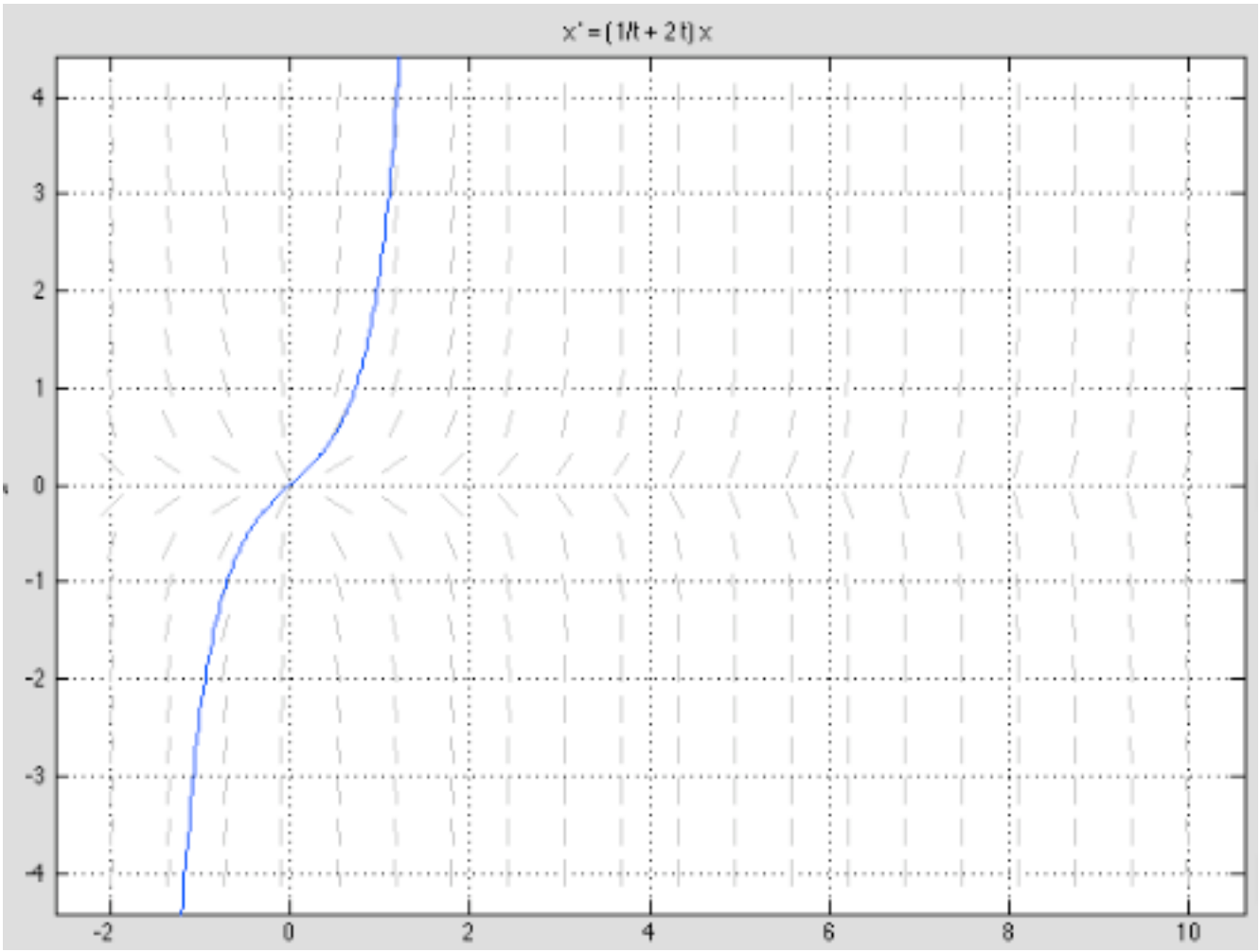


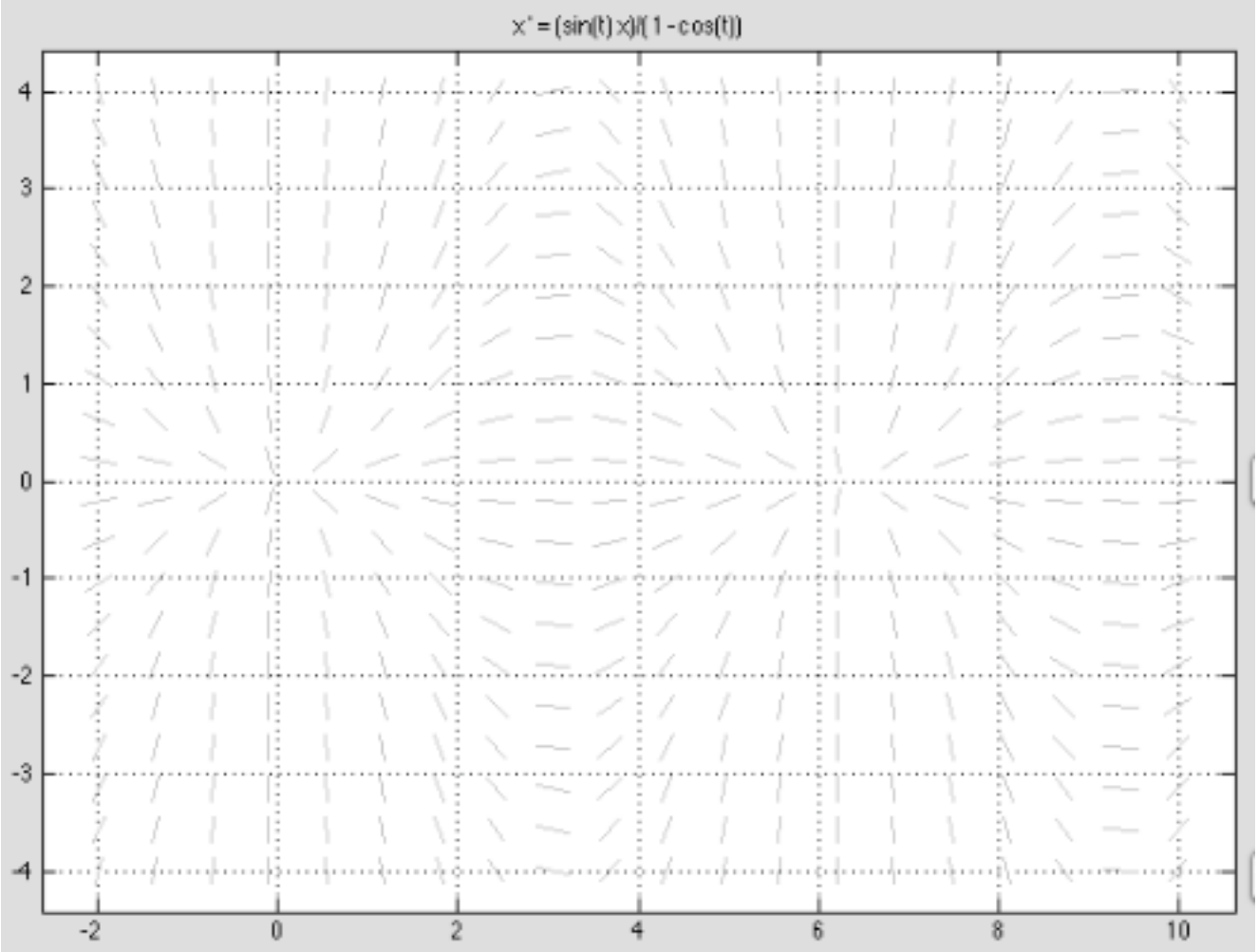
Plotting Slope Fields in MatLab

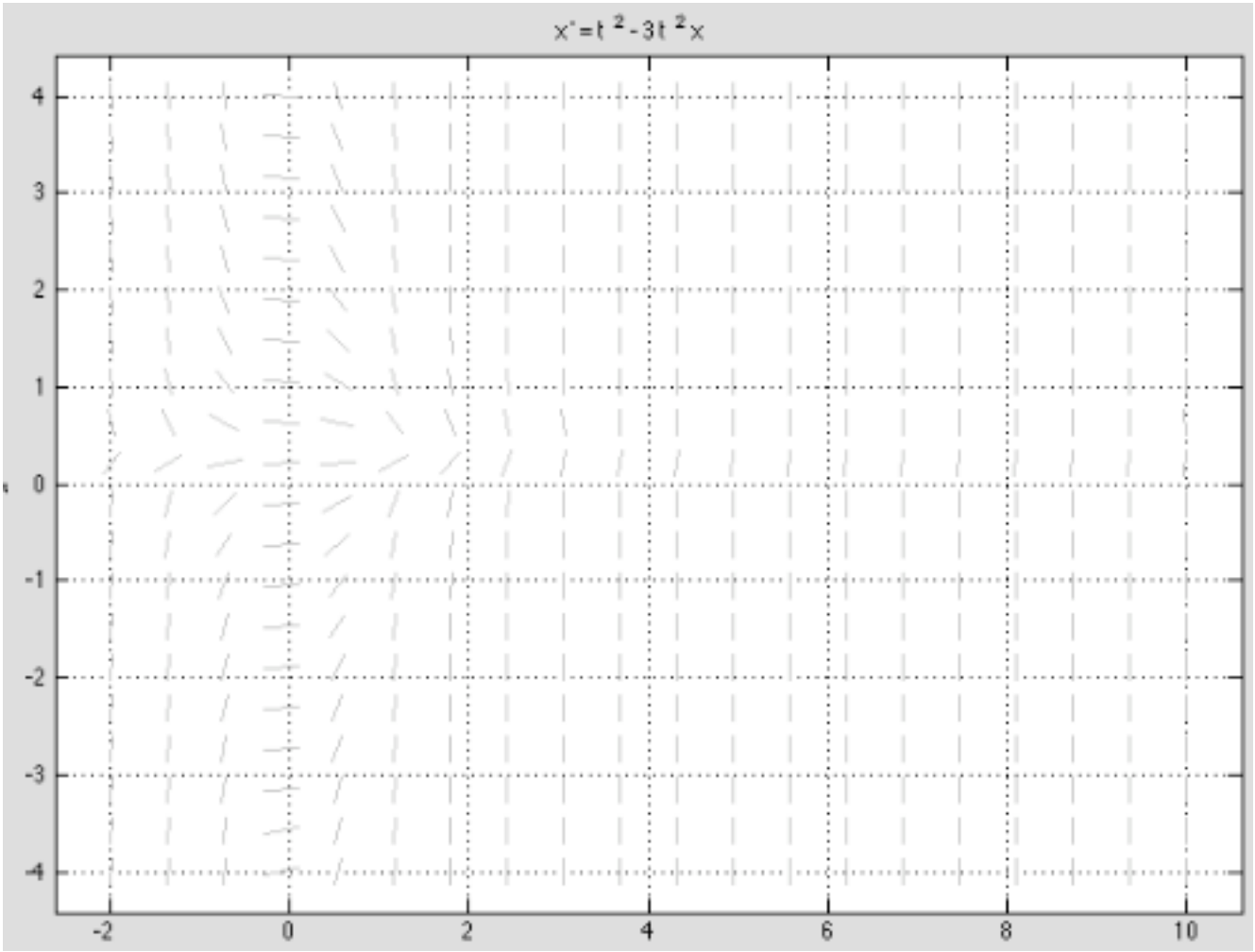
```
function plotSlopes()
%
tIN=-2:0.75:5;
yIN=-2:0.75:5;


[t,y] = meshgrid(tIN,yIN);
z=exp(0.5*tIN.^2);

% ODE goes here
slope = (t*y);
subplot(1,2,1);
quiver(t,y,ones(size(t)),slope,'b')
subplot(1,2,2);
plot(tIN,z,'r','LineWidth',2);

end
```

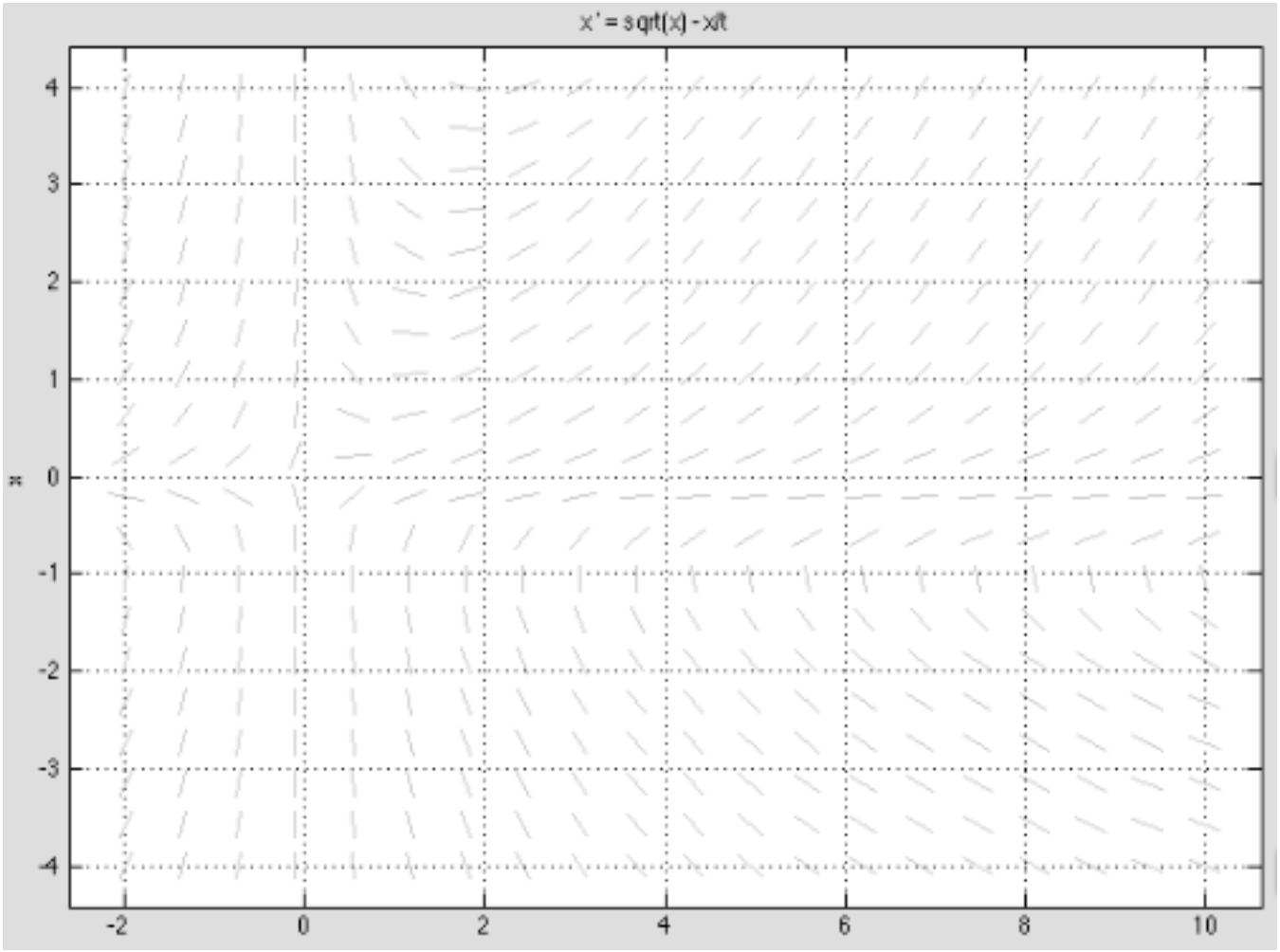


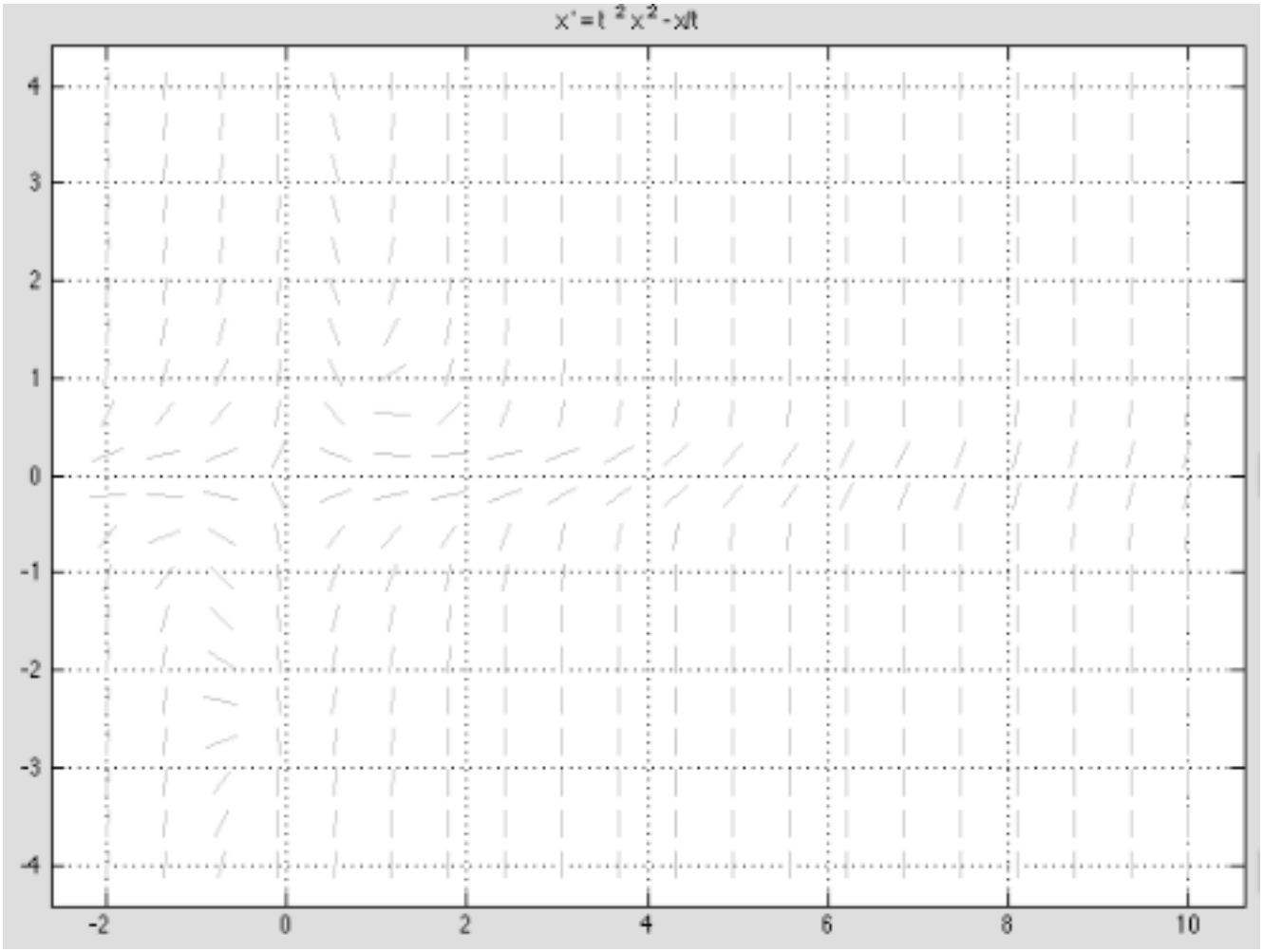



x' = (1/t + 2 t) x
4
3
2
1
0
-1
-2
-3
-4
-2
0
2
4
6
8
10


x' = (sin(t) x)/(1 - cos(t))
4
3
2
1
0
-1
-2
-3
-4
-2
0
2
4
6
8
10


x'=t ^2-3t ^2x
4
3
2
1
0
-1
-2
-3
-4
-2
0
2
4
6
8
10


x' = sqrt(x) - x/t
x
4
3
2
1
0
-1
-2
-3
-4
-2
0
2
4
6
8
10


x' = t ^2 x^2 - x/t
4
3
2
1
0
-1
-2
-3
-4
-2
0
2
4
6
8
10