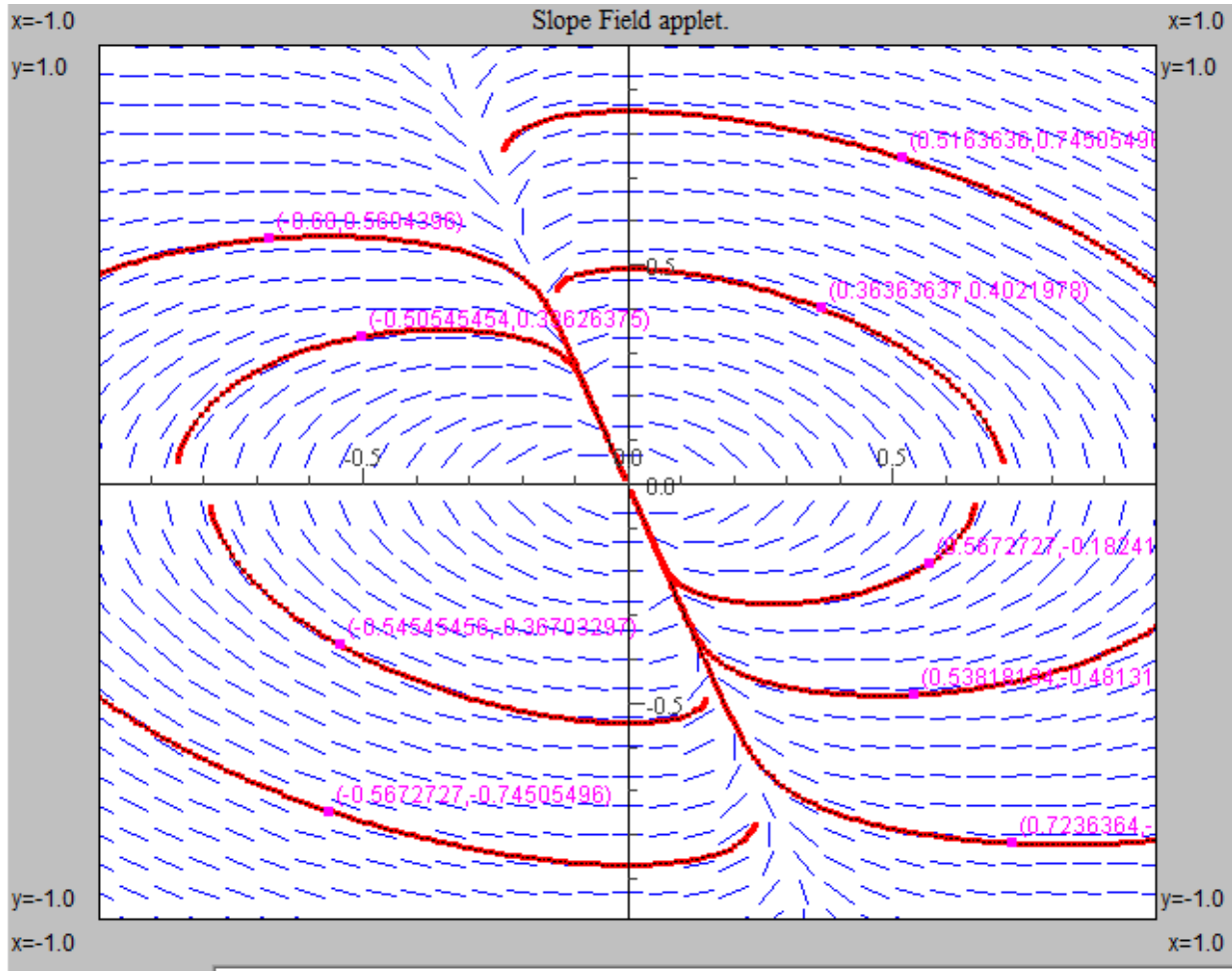


Do a qualitative analysis for: $(x^2 + xy) + (3xy + y^2)y' = 0$



eqn #1: $dy/dx = \frac{-(x^2+x*y)}{(3*x*y+y^2)}$

What are the AR sol'ns? Set the denominator to 0 and we get $y = 0$ and $y = -3x$

The AR sol'ns divide the plane up into 4 regions. Make a table and analyze what happens in each region. To what AR sol'n are sol'ns attracted? Repeled?

Is there an infinite or finite limit. If there is a finite limit, is it variable or fixed?

Region	Inequalities	Attraction	Repel	Limit analysis
1 (~QII)	$0 < y < -3x$	$y = -3x$	$y = 0$	$\lim_{x \rightarrow 0} y(x) = 0$
2 (~QIII)	$y < 0$ and $y < -3x$	$y = -3x$	$y = 0$	$\lim_{x \rightarrow a} y(x) = b$; $a > 0$ and $b < 0$ are finite & variable
3 (~QIV)	$-3x < y < 0$	$y = 0$	$y = -3x$	$\lim_{x \rightarrow a} y(x) = 0$; $a > 0$ is finite & variable
4 (~QI)	$y > 0$ and $y > -3x$	$y = 0$	$y = -3x$	$\lim_{x \rightarrow a} y(x) = 0$; $a > 0$ is finite & variable