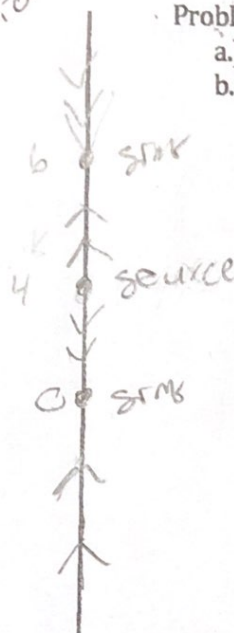
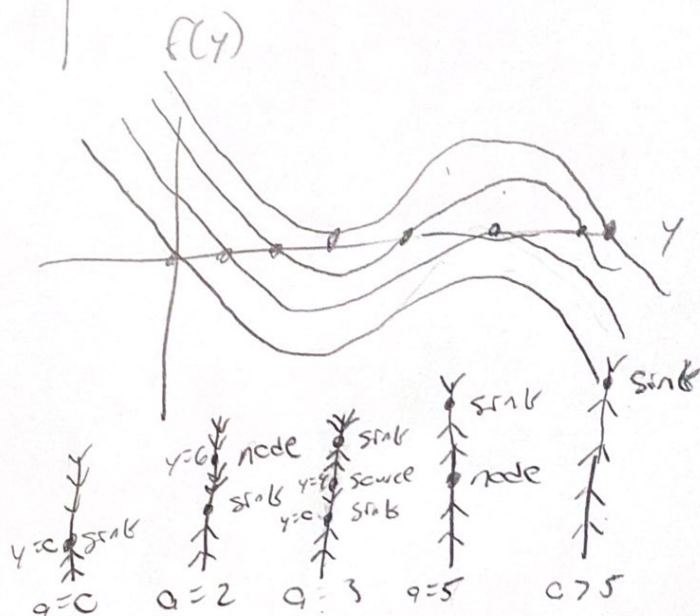
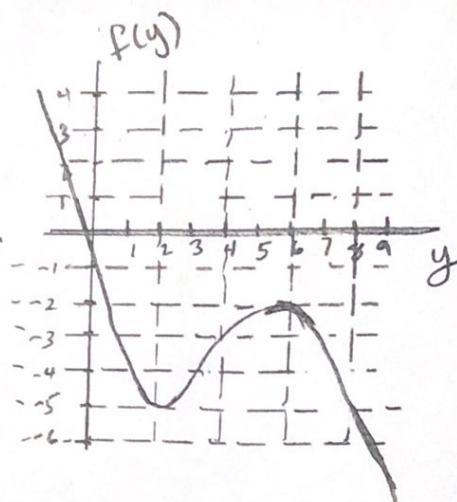


for (a)



Problem 3. To the right is the graph of a function $f(y)$.

- Give the phase line for $dy/dt = f(y)$ to the left.
- Below, draw the bifurcation diagram for the one parameter family $dy/dt = f(y) + a$ for bigger than or equal to zero. Be neat and be sure to specify the bifurcation values of a .



- Suppose you start with $a=0$ and then very slowly increase a . Describe in a sentence or two, the behavior of the solution with $y(0)=0$ as a slowly increases.

As you increase a from $a=0$ very slowly, if $a=0$, the phase plane has one equilibrium point, if $a=2$, the phase plane has two equilibrium points, if $a=3$, the phase plane has three equilibrium points, if $a=5$ the phase plane has two equilibrium points, and if $a>5$, the phase plane has one equilibrium point.