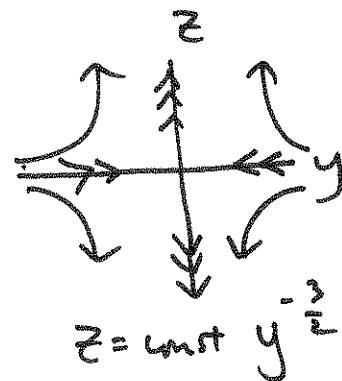
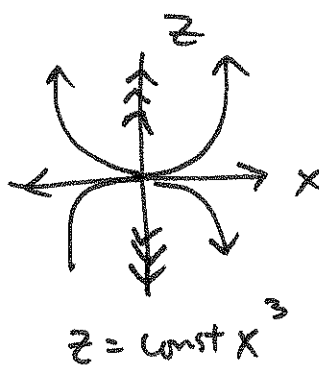
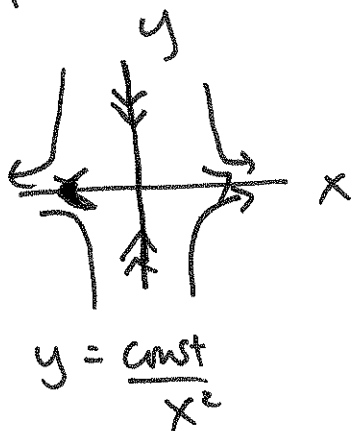


# MAT 665 - Swift Phase portraits for uncoupled linear systems in $\mathbb{R}^3$ .

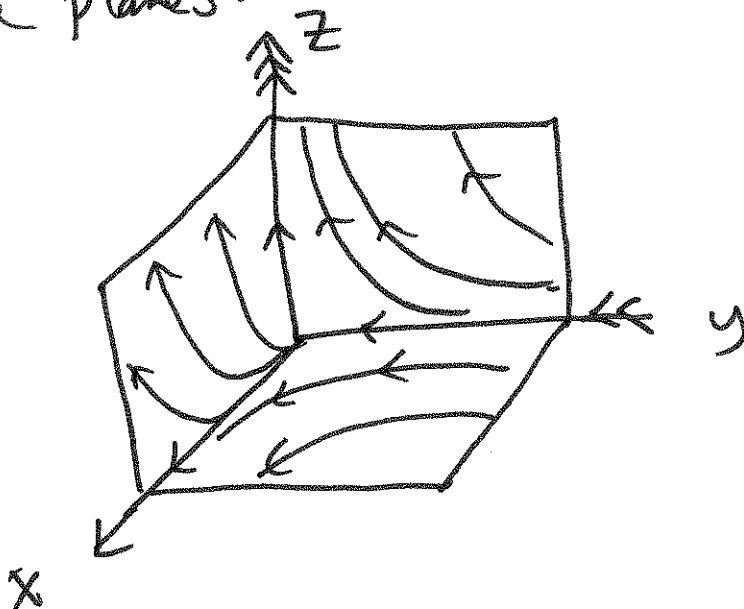
Ex.  $\dot{x} = x$   
 $\dot{y} = -2y$   
 $\dot{z} = 3z$

Solution  $x = C_1 e^t$   
 $y = C_2 e^{-2t}$   
 $z = C_3 e^{3t}$

Plot the phase portrait in each of the 3 coordinate planes - which are invariant under the flow



Then you can try to make a 3-D phase portrait showing these planes:



example 2. Draw the 3-D phase portrait for

$$\dot{x} = -x$$

$$\dot{y} = -2y$$

$$\dot{z} = -3z$$

With some practice, you can do these quickly:

