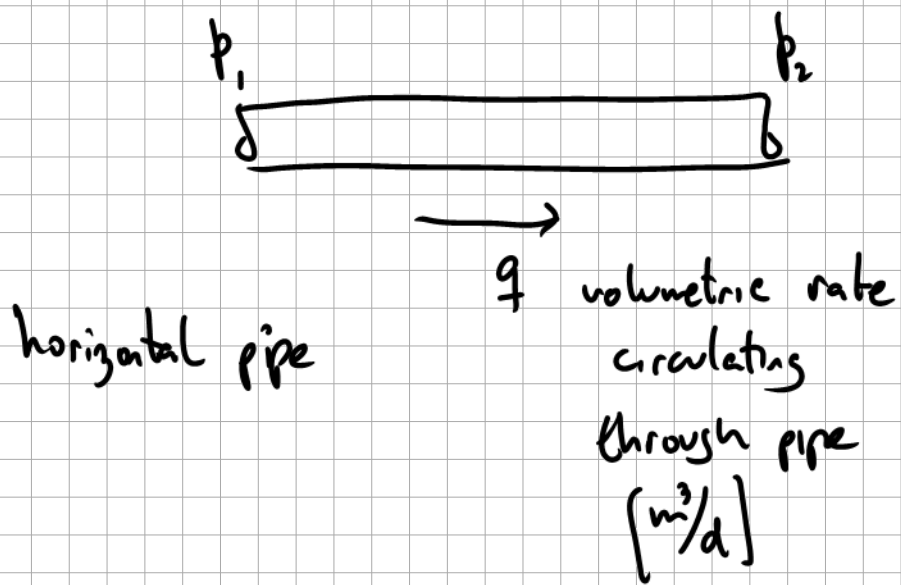


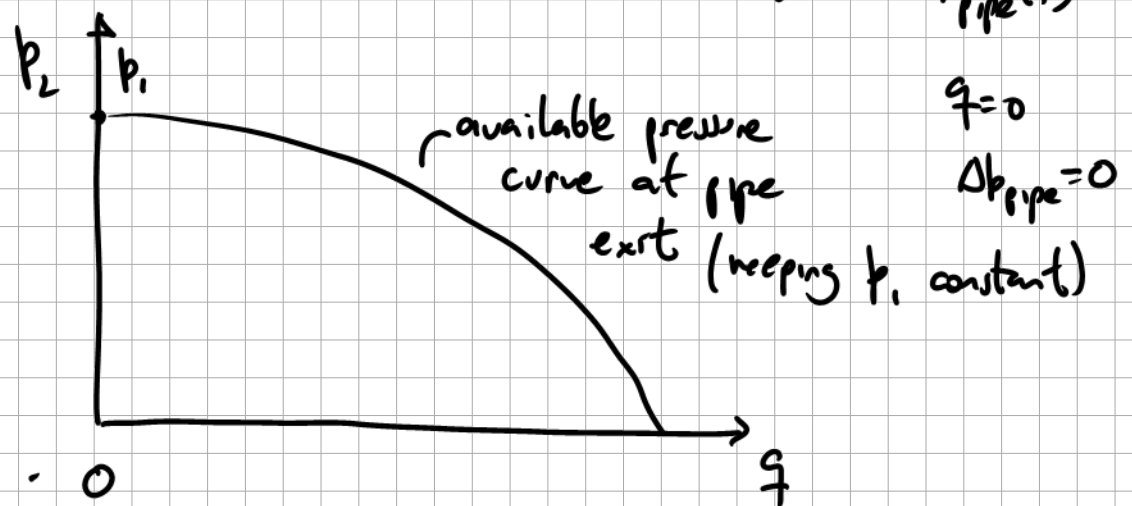
Oil and gas production wells

flow equilibrium



1) keep p_1 constant, vary q

$$p_2 = p_1 - \Delta p_{pipe}(q)$$



2) keep p_2 constant, vary q , compute p_1

$$p_1 = p_2 + \Delta p_{pipe}$$

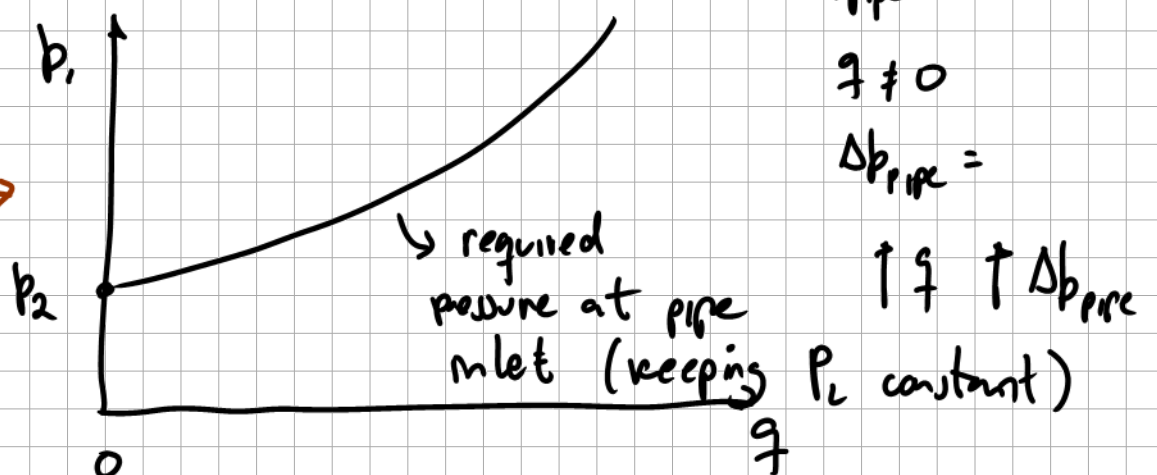
$$q=0$$

$$\Delta p_{pipe}=0$$

$$q \neq 0$$

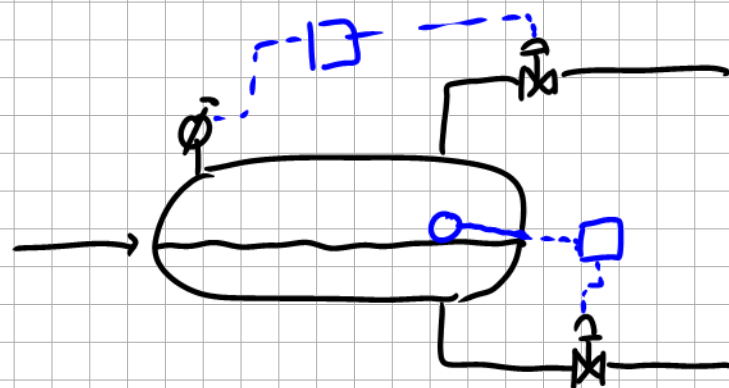
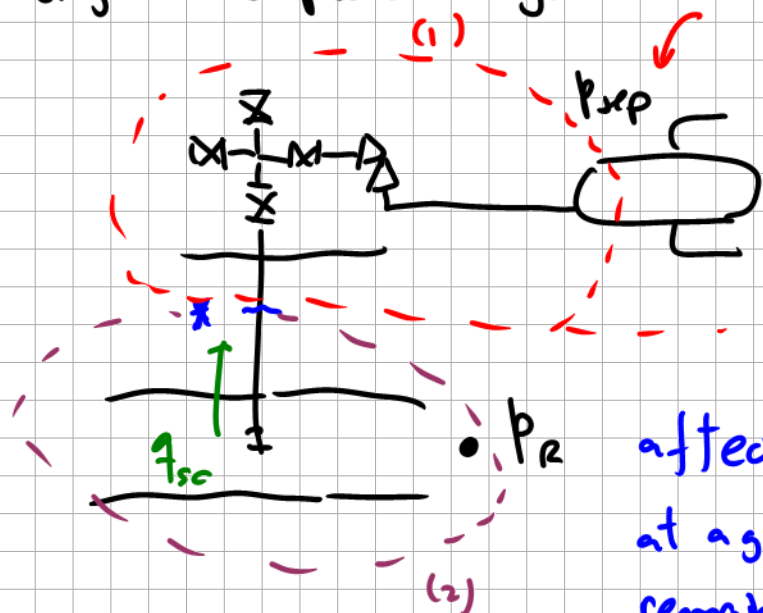
$$\Delta p_{pipe} =$$

$$\uparrow q \uparrow \Delta p_{pipe}$$



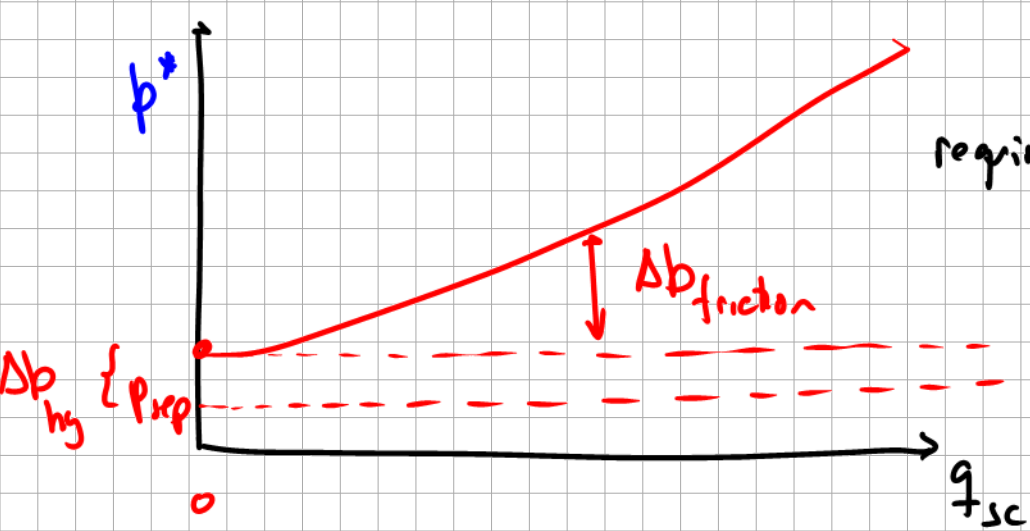
3) provide $p_1, p_2 \rightarrow$ calculate q

Single well production system



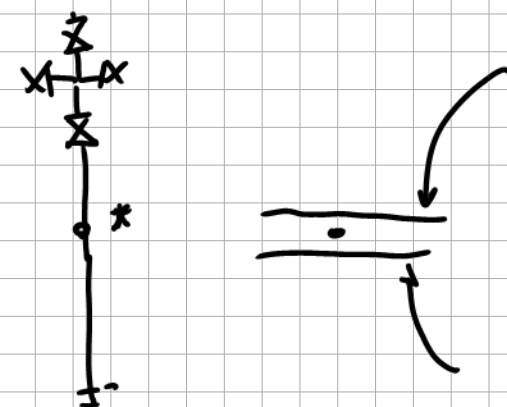
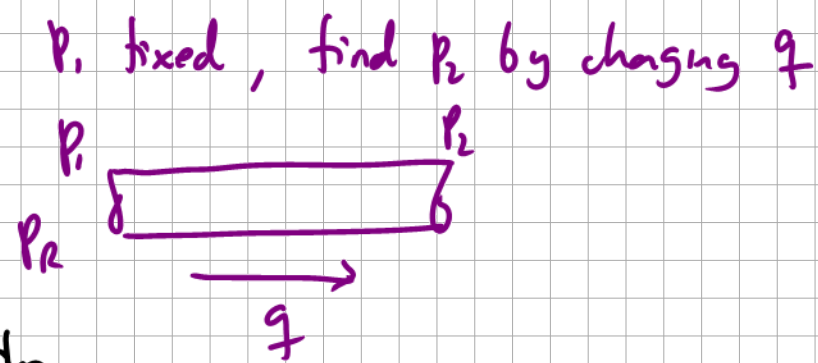
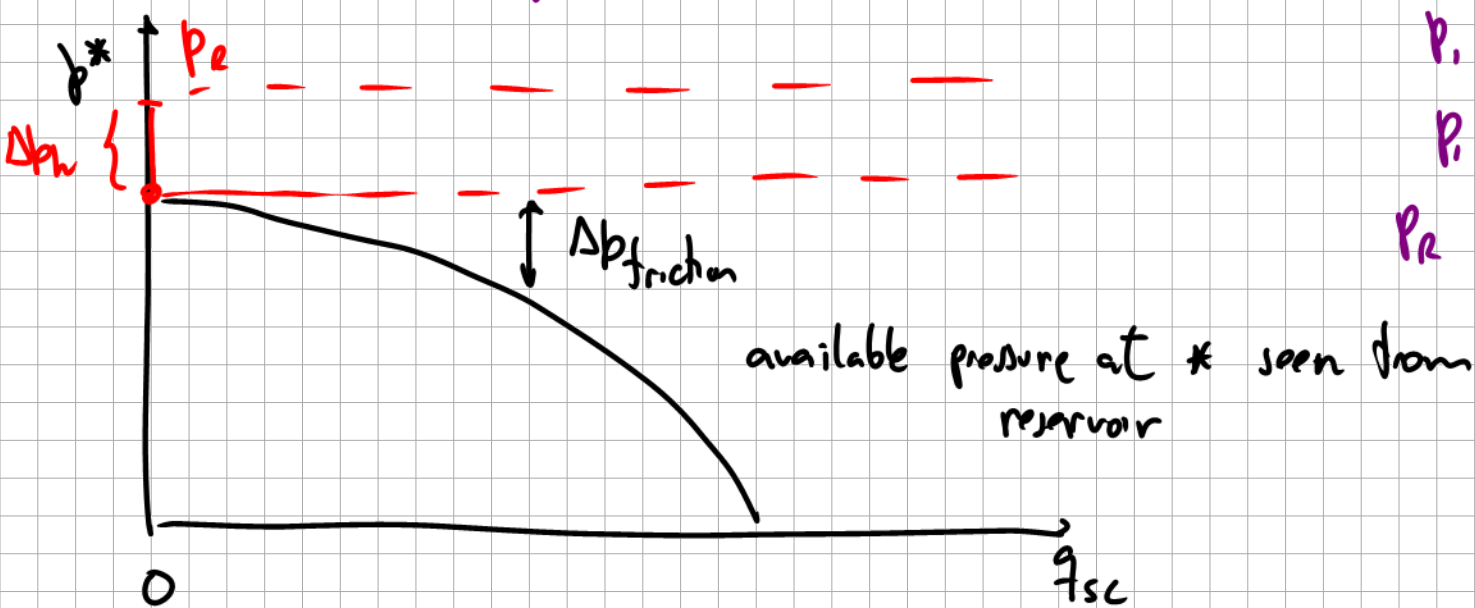
system (1) resembles case 2

required pressure at p^* (seen from separator)



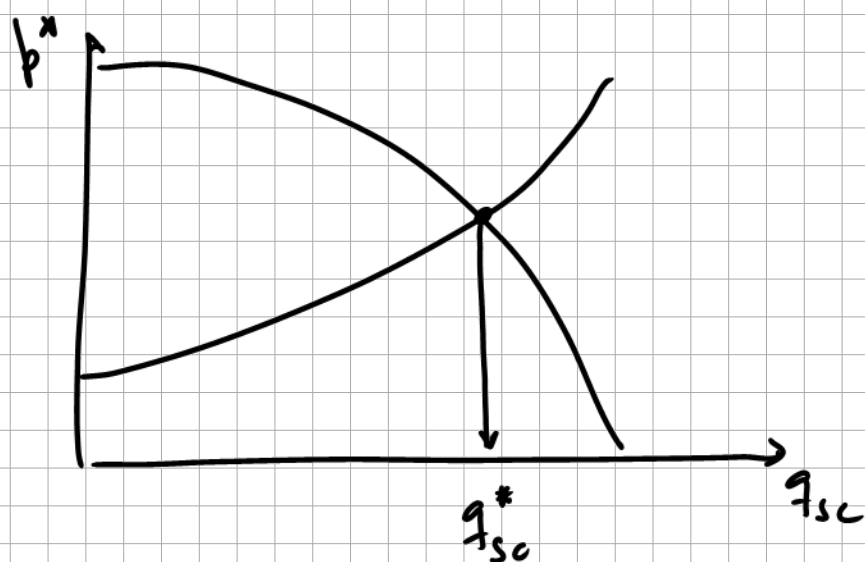
m^3/d affected by p, T
 $T_{sc} = 15.56^\circ C$
 Sm^3/d unaffected by p, T , $p_{sc} = 1.01325 \text{ bara}$

system (2) (formation and part of tubing) resembles case (1)



at p^* there should be only one pressure ! ▽

overimpose the two curves



↳ equilibrium rate of the system when put together ▽