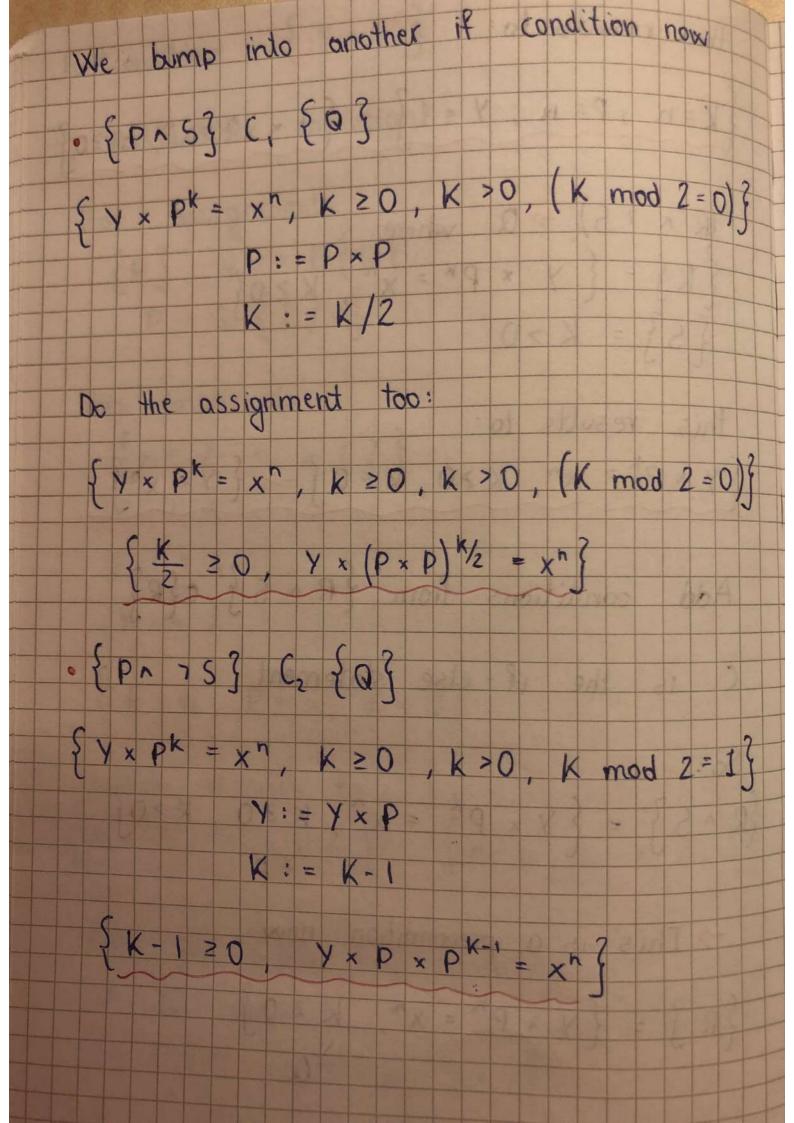
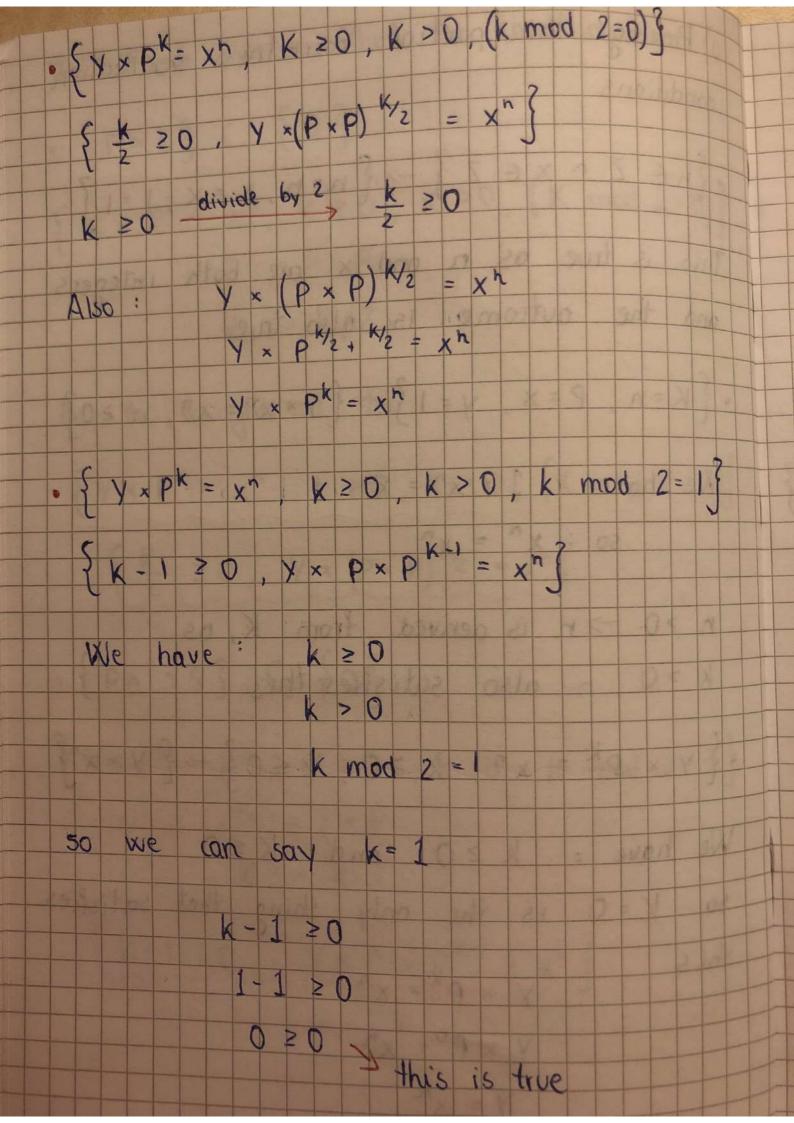
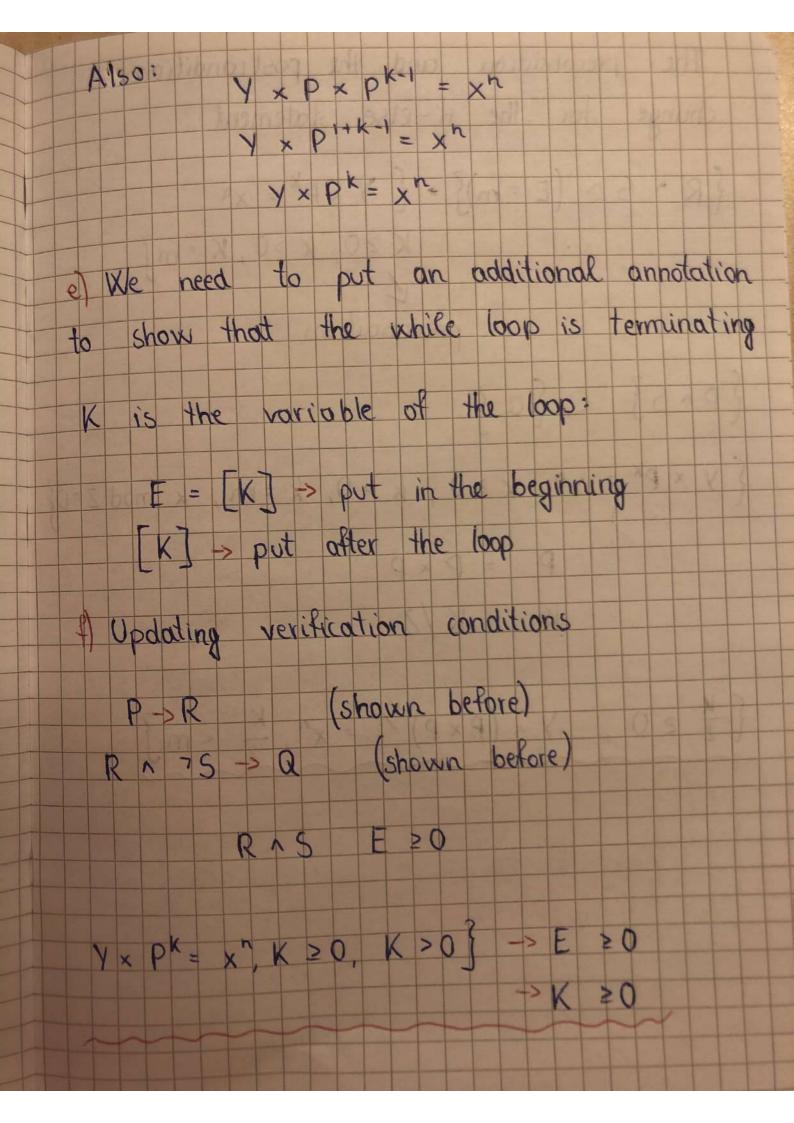


this results to: { 1 × x = x , n ≥0 { K=n, P=x, 4 = -> Q where PX = K ≥ 0 { this results to: Y x PK = xn, K 20, K < 0 (-> y = xr conditions from PR15 CSR? Add the if-else statement is PK -> This is a precondition now { R } = { y x P x = x h > This is a postcondition now



d) Proving the partial correctness verification conditions · {ne z n x e z ] -> {n=n, x = x, 1=1? This is true as n and x are both integers and the outcome is also true · {K=n, P=x, y=13-> {1 x xh=xh, n 20} We have : 1 x xh = xh 50 : Xn = xn n >0 > n is derived from K, as K > 0, n also satisfies this · { y x pk = xn, k ≥0, k ≤0 } > { y = xn} We have: K ≥ 0 and K ≤ 0 so K = 0 is the only thing that satisfies this Y × PK = Xh YxPo=xh Y = Xm





The precondition and the postcondition change for the if-else statement: R ~ S ~ (E=m) } = y x p k = x h K > 0, K > 0, K = m { precondition postcondition P ~ S ? C, {Q ? Y x pk = xn, K ≥0, K >0, K = m, k mod 2=0} P:=PxP K: = K/2  $\begin{cases} K \geq 0, Y \times (P \times P)^{\frac{K}{2}} = x^n, \frac{K}{2} \leq m \end{cases}$