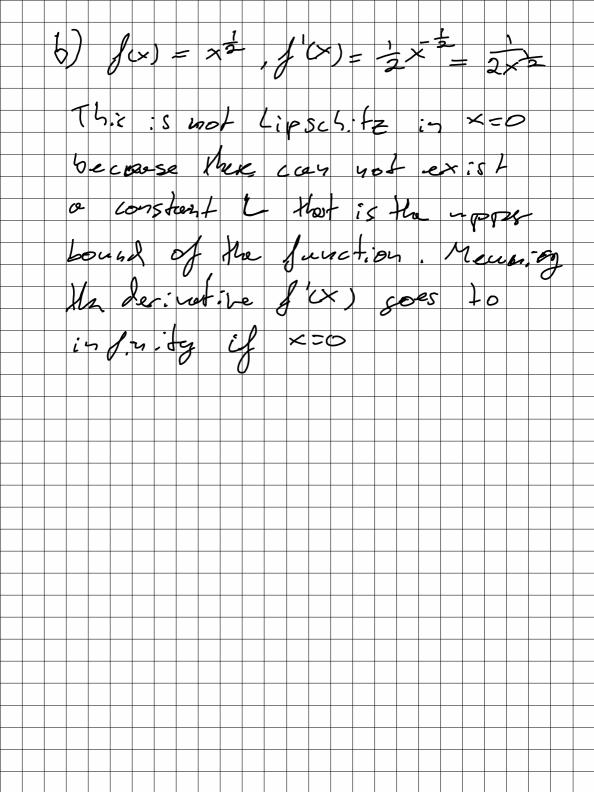
155; genen 1 The mean vales Theorem e for multivarial factions state that with J: Rh -> 12 From the example be have the Junction f(x) = x3 + 3x, x2 and we use x = [0,0] and P=[2,1]T. This gives: f(x)=0 and $f(x+p) = (x_1+p)^3 + 3(x_1+p_1)(x_2+p_2)^2$ = 23 +3.2.1 = 14

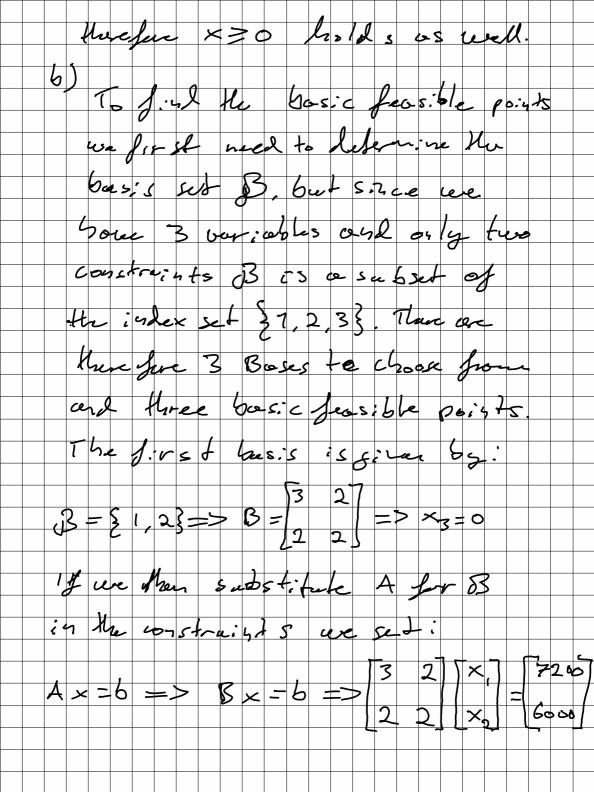
The grant zet is given $\nabla f(x+\Delta P) = \left[3(x,+\Delta P)^2 + 3(x_2+\Delta P_2)\right]$ 6 (x, xx g) (x2+0x g) $(2P)^{2} + 3(2P_{2})^{2}$ (αP_2) $\frac{122^{2}+32}{122^{2}} = \frac{152^{2}}{122^{2}}$ V f (x + x g) = [15x 12x 7] $=302^{2}+120^{2}=420^{2}$ J(x+p)=J(x)+VJ(x+2p)Tp 422=14 We have one & E(0,1) => 4 3

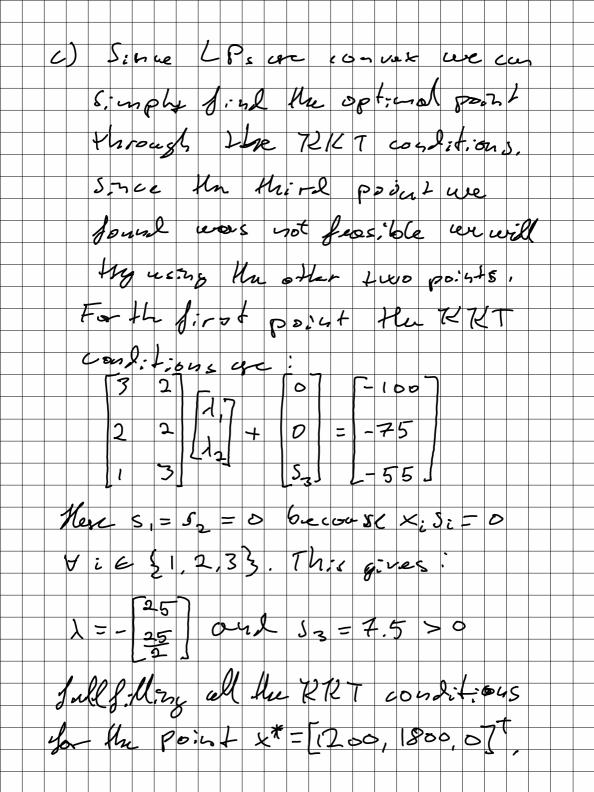


Problem 2 v:4 ct x s + Ax = 6, x > 0 with CEM, XER and bER $L(x, \lambda, s) = cTx - \lambda T(xx - b) - sTx$ We find the KKT conditions by for I find in the grandent of I with regards to x then setting this to Zero. J. J. (x, x, S) = 2 cTx -2 x A. + 2 T 2 STX $= \zeta - (\sqrt{A})^{T} - S$ We set this to two onlines X*TAT+S*= C The rest of the KKT coulilies

4 × = 6 5 7 0 XS = O V ; EN GS per theoreme 12.1: IN NOW Problem 3 a) To solve this maximation Problem as an LP we need to solve it as a minimiscetion of He negative cost. We also choose X, x2 and x3 to represent R, 5 and Trespectively. We want the problem on the form m.n 47x, Ax = 6, x = 0 to ochien this we use at = [c, cz,c] = [-100, -75, -55]

Fuller more, We have that the A constraint is mal: zel 45-45 ; $3x, + 2x_2 + 1x_3 = 7200$ where the coeff; counts of the Polynomial is sizen by the hours neeled at the A productions tage Similarly the B constraint is realized with: $2 \times + 2 \times_2 + 3 \times_3 = 6000$ Entering His into the CP strandard from we seeve that; $A \times = \begin{bmatrix} 3 & 2 & 1 \\ 3 & 2 & 1 \\ 2 & 2 & 3 \\ 3 & 2 & 5 \\ 2 & 2 & 3 \\ 3 & 3 & 5 \\ 3 & 3 & 5 \\ 4 & 3 & 5 \\ 6 & 0 & 0 \\ 3 & 3 & 5 \\ 6 & 0 & 0 \\ 3 & 3 & 5 \\ 6 & 0 & 0 \\ 3 & 3 & 5 \\ 6 & 0 & 0 \\ 6 & 0 &$ it naturally follows that we can sot produce negotive product





the maximal prof. 1 is Marefere CTX* = -100.1200 - 75.1800 =-250000 NOK 5) The dual poblem - 5 Daylines mex 67, s.t. AT, Sc this is supossed to give the Sume result as usin CIX: 6 7 = 7200- (-25) + 6000. (-25) = -255000 It holds. e) c7x = -255000 = 67x *

