Hork stock How			
Par day: 101101201 The da		LEOR 4W4	
		Ruf. Knoer	fw#1
$\frac{3x_{1} + x_{2} + x_{3}}{x_{1} - x_{1} + x_{2}} + x_{2} = \frac{10}{10}$ $\frac{x_{1} + x_{2} - x_{3}}{x_{1} + x_{2} - x_{3}} + x_{1} = \frac{10}{10}$ $\frac{x_{1} + x_{2} - x_{3}}{x_{2} - x_{2} - x_{3}} + x_{1} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3} - x_{3}} + x_{1} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3} - x_{3}} + x_{2} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3} - x_{3}} + x_{2} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3} - x_{3}} + x_{2} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}$		Due deve: 10/10/2019	Zinni Zhan
$\frac{3x_{1} + x_{2} + x_{3}}{x_{1} - x_{1} + x_{2}} + x_{2} = \frac{10}{10}$ $\frac{x_{1} + x_{2} - x_{3}}{x_{1} + x_{2} - x_{3}} + x_{1} = \frac{10}{10}$ $\frac{x_{1} + x_{2} - x_{3}}{x_{2} - x_{2} - x_{3}} + x_{1} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3} - x_{3}} + x_{1} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3} - x_{3}} + x_{2} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3} - x_{3}} + x_{2} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3} - x_{3}} + x_{2} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}}{x_{3} - x_{3}} + x_{3} = \frac{10}{10}$ $\frac{x_{1} + x_{2} + x_{3} + x_{3}$	J.	max = 2x, - x+ + x>	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			
X1 + Y2 - X3			
# first . Institut by is x = 10.0.0.0.0.10.10) total \$=0 # There we have \$1 power \$1 to a positive value. # find the constraint \$4 = 50 - 5x, 20 \$5 = 10 - x1			
# first. Initial by is x = 10.0.0.0 to 10.00 positive value. # flow, we improve XI from 0 = 0 a positive value. # find the invariant XI form 0 = 0 a positive value. # find the invariant XI form 0 = 0 a positive value. # find the invariant XI form 0 = 0 a positive value. # XI = 10 - XI = 20			
* There and inverse X1 from 0 to a positive value I find the constraint		· · · · · · · · · · · · · · · · · · ·	
### ### 10000000000		* first, initial lefs is $x = 10.0.0.0.0.10.20)^T$ with	} =0.
$ \begin{array}{ccccccccccccccccccccccccccccccccccc$		* Thus, we invene to form o to a positive value	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		7 find the constraint: X4 = 60-5x, 20	
## How the Vertex becomes (10, 0, 0, 30, 0, 10) WITH $\frac{1}{2} = 3x \cdot 0 = 0 + 0 = 20$ ### $\frac{1}{2} = 3x \cdot 0 = 0 + 0 = 20$ ### $\frac{1}{2} = 3x \cdot 0 = 0 + 0 = 20$ ### $\frac{1}{2} = 3x \cdot 0 = 0 + 0 = 20$ ### $\frac{1}{2} = 3x \cdot 0 = 0 + 0 = 0$ #### $\frac{1}{2} = 3x \cdot 0 = 0 + 0 = 0$ #### $\frac{1}{2} = 3x \cdot 0 = 0 + 0 = 0$ ###################################		$x_2 = x_1 \ge 0 \Rightarrow x_1 \le x_2 $	
Moth $\frac{1}{3} = \frac{1}{3} \times .0^{-0} + 0 = 20$ $\frac{1}{3} = \frac{1}{3} \times .0^{-0} + 0 = 20$ $\frac{1}{3} = \frac{1}{3} \times .0^{-3} \times $		X6= 10- X1 20	
		→ now the vertex perones (10,0,0,30,0,10)	
$4x_{3}-5x_{3}+x_{4}-3x_{5}=30 \qquad 0-10$ $x_{1}-x_{2}+x_{3}+x_{5}=10$ $2x_{3}-3x_{3}-x_{5}+x_{4}=10 \qquad 0-10$ $4 = 700000000000000000000000000000000000$		with }= dx10 -0+0=20	
$4x_{3}-5x_{3}+x_{4}-3x_{5}=30 \qquad 0-10$ $x_{1}-x_{2}+x_{3}+x_{5}=10$ $2x_{3}-3x_{3}-x_{5}+x_{4}=10 \qquad 0-10$ $4 = 700000000000000000000000000000000000$			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		max f=2x,-x+x3 = f= xx-3x3-2x5+20	
2x ₂ -3x ₃ - Xs + Xs = 10 ($\frac{1}{3}$)- $\frac{1}{2}$ 4 Thus, we turned to fore to positive 3 find -the campaints: X ₄ = 30 - 4x ₂ 30 X ₁ = (2 + x ₂ 30 $\xrightarrow{-1}$ x ₂ $= 5$ X _b = 10 - 2x ₂ 20 3 positive vector becomes (15, 5, 0, 10, 0, 0) hith $\frac{1}{3}$ = 5-0 - 0 + 10 = 15		$4x_3 - 5x_3 + x_4 - 3x_5 = 30$ $0 - 30$	
4 Thus, we Therefore Xx for the printice $ \begin{array}{cccccccccccccccccccccccccccccccccc$		$\chi_1 - \chi_2 + \chi_5 + \chi_5 = 10$	
$X_4 = 30 - 4x_1 = 30$ $X_1 = 10 + x_1 = 5$ $X_2 = 10 - 2x_1 = 5$ $Y_3 = 10 - 2x_1 = 5$ $Y_4 = 10 - 2x_1 = 5$ $Y_5 = 10 - 2x_1 = 5$ $Y_6 = 10 - 2x_1 = 5$		$2x_2 - 3x_3 \qquad -XC + XL = 10 \qquad G - B$	
$X_4 = 30 - 4X_2 = 20$ $X_1 = 10 + X_2 = 20$ $Y_6 = 10 - 2X_2 = 20$		4 Thus, we russeuse to from seno to positive	
$X_{1} = 10 + X_{2} = 5$ $X_{h} = 10 - 2X_{1} \ge 0$ $y_{h} = 10 - 2X_{1} \ge 0$		I find the constraints:	
$\frac{\chi_{b} = 10 - 2\chi_{b} z_{0}}{3 \text{ pure the vertex becomes (15, 5, 0, 10, 0, 0)}}$ $\frac{1}{b_{0}} = \frac{10 - 2\chi_{b} z_{0}}{10 + 10 - 15}$		$X_4 = 30 - 4X_2 = 30$	
\exists now the vertex browning (15, 5, 0, 10, 0, 0) with $b = 5 - 0 - 0 + 10 = 15$		$X_1 = 10 + X_2 X_2 \stackrel{<}{=} 5$	
hitt: 8 = 5 - 0 - 0 + 20 = 25		Xb = 10-2X130	
		7 now the vertex becomes (15, 5, 0, 10, 0, 0)
		hitly 8 = 5-0-0+20=25	

$w_{1} = -\frac{7}{2} x_{2} - \frac{3}{2} x_{3} - \frac{3}{2} x_{5} - \frac{1}{2} x_{6} + 25$	3 8
$x_3 + x_4 - x_5 - 2x_3 = 10$ (D-213)	1"
2X1 + X3 + Xc + Xb = 30 20 + 3	
$2\chi_{L}-3\chi_{S} \qquad -\chi_{C}+\chi_{b}=10$	-1
Since the object is $\frac{3}{2} = -\frac{3}{2} \times 5 - \frac{3}{2} \times 5 - \frac{3}{2} \times 5 - \frac{3}{2} \times 5 + \frac{3}{2} \times 5 $	- A.A.
phase I 2. Max $f = dx_1 + 3x_2 \Rightarrow min xs + x_6 \Rightarrow max f = -x_5 - x_6$	
$\frac{1}{2}X_1 + \frac{1}{2}X_2 + \chi_3 = 4$	
$x_1 + 3x_2 - x_4 + x_5 = 20$	
$X_1 + X_2 + X_6 = 4$	
$\chi_1 \sim \chi_6 \gg 0$	
* Initial ofs (0,0,4,0,10,4) with 7=-20-4=-14	
The our the wefficents towerpoundy to have variables	
In the object: 7= 2×1+4×2-×4-24	
* Thu, we invene & by Invene x	e constant
- find the wastrains	
X3 = 4 - 4 X2 20	
X5 = 20-3×20 → X, €4	
YL = 4- X, 20	
= Vertry becomes (0, 4, 3, 0, 8, 0) note }= 4x4-0-24=-8	
mmx 7= 2x1+4x1-xq-24=2x1+4(4-X1-X6)-x4-24=-2x1-x4-4x6-8	
X1 + 4X3 - X6 = 12 (Dx 4 - 3)	
2×1 +×4-×5+3×6 = -8 3(3-12)	
$\chi_1 + \chi_2$ $\chi_b = \psi$	
a contract of the contract of	

Since we can no longer optimize the object and the artificial variable is still non-zero It is inferrible + providing proved by amobi 3 1) Since the convent object writing X1 and X6 and it is a particul turbeaux, X1, X4 could not be part of the basis of the basic variables 2) Band on 3, 17. The basic variables should be among 23,45. Howares, of 3,4 ave both basic variables, then they should be in two different rows Homeway, for now Xz takes up me one, and time's only one MN left for 2.4 a d. 5.4 would not be 3). } -x1 0 0 +x4 0 -x6 = 7 0 0 0 +x4 x5 + bx6 = 6 * well of bout =0 * = XI+ XL+7 = could inverse Xb. by 4) are argued above. Yo + must be a basic solution give the takean has excuting 3 morters empiles 1 mm 3 from 2, 3, 4.5, and court be the aux with my 2.3.4) Then ter the first new

equento axs + bxb = c , while a, b, c +0	
the parties terms to.	1
$-x_1 \qquad 0 -x_1 = 7$	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
$\gamma_{2} \qquad 0 \qquad +2 \times 6 = 5$	5
x, 0 0 = d.	
11	
These setting the constraint of Xo	
5-2x6 20 > x6 52.5	
$C - p \times p \times Q \times$	
* if a chure different sign => x5 <0 then infeasible	
- I us uptimer solution	
* I ac have the same sign	
$\frac{1}{2} \cdot \alpha \times S = C - b \times b + X = \frac{c}{\alpha} - \frac{b}{\alpha} \times b = \frac{c}{\alpha}$	
$\frac{b}{a} \forall b \leq \frac{C}{a}$	
* - \$ 11.6>0 px = c . pro X6 = b 0 proprie	
- bco X6 > t in paris	44
* + a.co. bx > b > 5 + measure	
beo Yos & positive	10 pc
Therefore, there always exists an yo such	
that make the object noore grewer	
> convent & court be optimal.	
5) Since X (unt be optimen, X wandrit even be	
The inique optimer solution to the problem	
- x ₆ = 7	
0 0 0 0 X5 D = -3 + singe X=-3 <0	
- 2x1 0 x3 0 0 +2x6 = 5 rufeusible	
$\chi_1 + \chi_2 = 0 0 0 = 5$	25.01
X1 T X2 U U	
	2

object: new CTX - I dixi
wastraints: $A \times \leq b + \left[\begin{array}{c} \lambda_1 \\ \vdots \\ \lambda_m \end{array}\right]$
\(\lambda_1 \) \(\lambda_1
X >>0
5. Objects: primary CTX Secondary dTX
* First, we find the optimen by x for primary object were CT: X = M interes mis the value of the object
* Then, we move on to the lecondary object
hert max d'x
$constraint c^{7} x = m$
Solving the newly constructed system gives the
solution that maximize the primary objective function
Seuriday abjective franction

b. No. It we transform IP into the form	-
max Cx: Ax=b. it laws continues. In this	-
care, the stark partificar variables don't have	
strict constrainty & they might be positive or regaring.	
In this way, the original system of inequality	
funting might not hold when optiming the object.	
Therefore we could array transform it in	
The form max c7x: Ax=b.	
·	
	11 300 30
-	
	-