max $\overline{z} = x_1 + 2x_2$ Non-integral ths $x_2 + \frac{2}{7}x_3 - \frac{1}{7}x_4 = \frac{20}{7}$ S.t. $x_1 + 3x_2 \le 13$ rearrange into integral and $2x_1 - x_2 \le 6$ Non-integral and $2x_1 - x_2 \le 6$ $x_2 + \frac{2}{7}x_3 - x_4 + \frac{6}{7}x_4 = 2 + \frac{6}{7}$ Solve the UP relaxation $x_1 + x_2 = x_3 + \frac{6}{7}x_4 - \frac{6}{7} = -x_2 + x_4 + \frac{1}{7}x_4 = 2 + \frac{6}{7}$ Solve the UP relaxation $x_1 + x_2 = x_3 + \frac{1}{7}x_4 - \frac{1}{7} = -x_2 + x_4 + \frac{1}{7}x_4 +$	Example	· The solution is non-integral.	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		· Selectany constraint with	0 1 1/3 0 -1/6 3 = *2
Set. $x_1 + 3x_2 \le 13$ $x_2 + \frac{7}{7}x_3 - \frac{1}{7}x_4 = \frac{27}{7}$ $x_2 + \frac{7}{7}x_3 - \frac{1}{7}x_4 = \frac{27}{7}$ $x_3 + \frac{1}{7}x_3 - \frac{1}{7}x_4 = \frac{27}{7}$ $x_4 + \frac{1}{7}x_5 - \frac{1}{7}x_4 = \frac{1}{7}x_4 = \frac{1}{7}x_5 + \frac{1}{7}x_4 = \frac{1}{7}x_5 + \frac{1}{7}x_4 + \frac{1}{7}x_4 = \frac{1}{7}x_5 + \frac{1}{7}x_4 + \frac{1}{7}x_4 = \frac{1}{7}x_5 + \frac{1}{7}x_4 + \frac{1}{7}x_4$	Max 7 - X - 2X	nonintegral rhs	1 0 0 0 12 4 = ×1
rearrange into integral and $2x_1 - x_2 \le 6$ normalization $x_2 = x_3 + x_4 + x_5 = x_4 + x_5 = x_5$ $x_2 = x_3 + x_4 + x_5 = x_5$ $x_3 = x_4 + x_5 = x_5$ $x_4 = x_5 + x_4 + x_5 = x_5$ $x_5 = x_5 + x_5 $	MAX E - VIT CAZ	$X_{2} + \frac{2}{x_{3}} = \frac{1}{3} X_{4} = \frac{20}{3}$	0 0 1/3 1 -7/6 1 - 1/4
** Solve the LP relaxation $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	s.t. $x_1 + 3x_2 \leq 13$		
* Solve the LP relaxation $ \begin{array}{ccccccccccccccccccccccccccccccccccc$		rearrange into integral and	0 0 73 0 10 0
* Solve the LP relaxation	2×1-×2 ≤ 6	nonintegral parts:	
• Solve the LP relaxation $ \begin{array}{ccccccccccccccccccccccccccccccccccc$	XZO, XEZZ	$x_2 + \frac{2}{7}x_3 - x_4 + \frac{6}{7}x_4 = 2 + \frac{6}{7}$	
1 (3) 1 0 13 = x_3 2 -1 0 1 $6 = x_4$ 50) $\frac{2}{7}x_3 + \frac{6}{7}x_4 - \frac{6}{7} = 0$ (integer) • Notice that x^* does not satisfy 1 2 0 0 0 = $\frac{2}{7}x_3 - \frac{6}{7}x_4 + x_5 = \frac{6}{7}$ • Also, any feasible integer solution 73 0 1/3 1 $\frac{31}{3} = x_4$ • Also, any feasible integer solution		2 6 6	支 = 10
$\frac{2}{73} = \frac{1}{73} $	• Solve the LP relaxation	$7x_3 + 7x_4 - 7 = -x_2 + x_4 + 2$	
1 2 0 0 0 == = - = x3 - = x4 + x5 = = = the new inequality constraint. 1/3 1 1/3 0 13/3 = x2 Add this new constraint: 1/3 0 1/3 1 31/3 = x4		So: 2 x + 6 x = 2 o (integer)	Is this really optimal?
1 2 0 0 0 = $\frac{1}{2}$			· Notice that x does not satisfy
7/3 0 1/3 1 31/3 = x4 Still satisfies the new constraint	1 2 0 0 0 = - 2	- 7×3- 9×4 + ×5 = 7	the new inequality constraint.
573 0 73 1 3/3 = x4 5111 satisfies the new constraint		Add this new constraint:	· Also, any feasible integer solution
	7/3 0 1/3 1 31/3 = x4		still satisfies the new constraint
	1/3 0 -2/3 0 -26/3 = -2		
$0 + \frac{2}{3} + \frac{3}{7} = $			In short: the new constraint is the negative
1 0 1/2 3/2 =x, 0 0 777 (797) 1 (797 = 1/5 C) Of the fractional part of alumintegral was	1 0 1/2 3/2 31/2 =x.		of the fractional part of a(nonintegral whs)
- - - - - - - - - -		0 0 7 17 0 7 17 2 - 2	
Constraint along with a rew state variable	0 0 97 111 111 -2		constraint along with a new slack variable.
X* = (31, 20,0) Apply the dval Simplex Method & fractional parts are always non-negative	X* = (31, 20,00)	Apply the dval Simplex Method	of fractional parts are always non-negative
$z^* = \frac{71}{4}$ $f(3.14) = 0.14$ $f(-3.14) = 0.86$	Z = 1		f(3.14) = 0.14 f(-3.14) = 0.86