Primal

$$\begin{aligned} \max:\ & x_1 + 3x_2 \\ \text{sub to:}\ & -x_1 - x_2 \le -3 \\ & -x_1 + x_2 \le -1 \\ & x_1 + 2x_2 \le 4 \\ & x_1, x_2 \ge 0 \end{aligned}$$

DUAL

$$\begin{aligned} \min:\ & -3y_1 - y_2 + 4y_3 \\ \text{sub to:}\ & -y_1 - y_2 + y_3 \ge 1 \\ & -y_1 + y_2 + 2y_3 \ge 3 \\ & y_1, y_2 \ge 0 \end{aligned}$$

$-z = 0 + 3y_1 + y_2 - 4y_3$

$w_1 = -1 + y_1 + y_2 - y_3$

$w_2 = 3 + y_1 - y_2 - 2y_3$

$-z = -4 - y_1 + 3y_2 + 4w_2$

$y_3 = -1 + y_1 + y_2 - w_1$

$w_2 = -1 - y_1 - 3y_2 + 2w_1$

$-z = -5 + 0y_1 - 2w_1 + w_2$

$y_3 = 4/3 + 2/3 y_1 - 1/3 w_1 - 1/3 w_2$

$y_2 = 1/3 - 1/3 y_1 + 2/3 w_1 - 1/3 w_2$

$-z = -5 + 0 - 2w_1 + w_2$

$y_1 = -2 - 2/3 y_3 + 1/2 w_1 + 1/2 w_2$

$y_2 = 1 + 1/2 y_3 + 1/2 w_1 - 1/2 w_2$

$-z = -5 + 0y_2 + 2w_1 + w_2$

$y_3 = 2 - 2y_2 + w_1 - w_2$

$y_1 = 1 - 3y_2 + 2w_1 - w_2$

$z = 5$

$-z = -5$

$y_1 =$	-2	0	1
$y_2 =$	1	$1/3$	0
$y_3 =$	0	$1/3$	2