

## Interpretation of Dual variables

### 1. Original Problem

MAX  $4 X_1 + 3 X_2$   
SUBJECT TO  
2)  $2 X_1 + X_2 \leq 12$   
3)  $- X_1 + 2 X_2 \leq 8$   
4)  $3 X_1 - X_2 \leq 9$

OBJECTIVE FUNCTION VALUE

1) 29.6000000

VARIABLE	VALUE	REDUCED COST
X1	3.200000	.000000
X2	5.600000	.000000

ROW	SLACK OR SURPLUS	DUAL PRICES
2)	.000000	2.200000
3)	.000000	.400000
4)	5.000000	.000000

### 2. Change Original Problem (new b1)

MAX  $4 X_1 + 3 X_2$   
SUBJECT TO  
2)  $2 X_1 + X_2 \leq 13$   
3)  $- X_1 + 2 X_2 \leq 8$   
4)  $3 X_1 - X_2 \leq 9$

OBJECTIVE FUNCTION VALUE

1) 31.8000000

VARIABLE	VALUE	REDUCED COST
X1	3.600000	.000000
X2	5.800000	.000000

ROW	SLACK OR SURPLUS	DUAL PRICES
2)	.000000	2.200000
3)	.000000	.400000
4)	4.000000	.000000

3. Change Original Problem (new b2)

MAX        4 X1 + 3 X2  
 SUBJECT TO  
   2)    2 X1 + X2 <= 12  
   3)   - X1 + 2 X2 <= 7  
   4)    3 X1 - X2 <= 9

OBJECTIVE FUNCTION VALUE

1)        29.2000000

VARIABLE	VALUE	REDUCED COST
X1	3.400000	.000000
X2	5.200000	.000000

ROW	SLACK OR SURPLUS	DUAL PRICES
2)	.000000	2.200000
3)	.000000	.400000
4)	4.000000	.000000

4. Change Original Problem (new b1)

MAX        4 X1 + 3 X2  
 SUBJECT TO  
   2)    2 X1 + X2 <= 18  
   3)   - X1 + 2 X2 <= 8  
   4)    3 X1 - X2 <= 9

OBJECTIVE FUNCTION VALUE

1)        40.6000000

VARIABLE	VALUE	REDUCED COST
X1	5.200000	.000000
X2	6.600000	.000000

ROW	SLACK OR SURPLUS	DUAL PRICES
2)	1.000000	.000000
3)	.000000	2.600000
4)	.000000	2.200000