# - More-for-less & Less-for-more Situations

Consider the following production LP problem:

Maximize X1 + 3X2 + 2X3

Subject to: X1 + 2X2 + X3 = 4, 3X1 + X2 + 2X3 = 9, all Xi are non-negative.

The total labors are 4 and 9. The optimal value for this problem is $7.

Now, if you change the second available labor from 9 to 12, the optimal value would be $4. That is, you've worked more hours for less profit.

# - Non-Linear Optimization

Solve the following problem:

Maximize X1 X23 X34

Subject to: X1 + 2X2 + X3 = 4, all Xi are positive

**- Linear Program in higher dimension:**

Solve the following problem:

- Maximize 3X1 + 2X2 + X3

Subject to: 4X1 + 2X2 + 3X3 ≤12, all variables Xi's ≥ 0