jstadden_9

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Question 1:
Y1P – Y1M = 6X1 + 4X2 + 5X3 - 50
Y2P – Y2M = 8X1 + 7X2 + 5X3 - 75
P = 20X1 + 15X2 + 25X3

Question 2:
Max: Z = P – 6C – 3D = 20X1 + 15X2 + 25X3 – 6Y1P – 6Y1M – 3Y2M

Question 3:

```
library(lpSolveAPI)
```

```
## Warning: package 'lpSolveAPI' was built under R version 3.6.3
```

```
gp <- read.lp("jstadden_9.lp")
gp
```

```
## Model name:
##             X1    X2    X3   Y1P   Y1M   Y2M   Y2P
## Maximize    20    15    25    -6    -6    -3     0
## R1           6     4     5    -1     1     0     0  =  50
## R2           8     7     5     0     0     1    -1  =  75
## Kind       Std   Std   Std   Std   Std   Std   Std
## Type      Real  Real  Real  Real  Real  Real  Real
## Upper      Inf   Inf   Inf   Inf   Inf   Inf   Inf
## Lower        0     0     0     0     0     0     0
```

```
solve(gp)
```

```
## [1] 0
```

```
get.objective(gp)
```

```
## [1] 225
```

```
get.variables(gp)
```

```
## [1]  0  0 15 25  0  0  0
```

Findings:
X1 = 0, X2 = 0, X3 = 15
Y1P = 25, Y1M = 0
Y2P = 0, Y2M = 0

This suggests Product 3 should have a production rate of 15.
Also, we are over the employment goal by 25 (2500 emplyees).
The penalty from exceeding the goal is 225.