 # *Sec II Q1*

```
restart;
r1 := rl; r2 := rk# Labor and Capital
```

$$r1 := rl$$
$$r2 := rk \quad (1)$$

```
ProfitStar := p^4/(5*rl*rk^2);
```

$$ProfitStar := \frac{p^4}{5\,rl\,rk^2} \quad (2)$$

 # *1. b:*

```
Hottlings_Lemma_SupplyFunction := simplify(diff(ProfitStar, p));
    #Hottlings Lemma gives supply function.
```

$$Hottlings\_Lemma\_SupplyFunction := \frac{4\,p^3}{5\,rl\,rk^2} \quad (3)$$

 # *1.a:*

```
Ordinary_Input_Demand_Function_x1 := simplify(-diff(ProfitStar, r1));
    #This is same as X1Star (Labor) from profit maximization.
```

$$Ordinary\_Input\_Demand\_Function\_x1 := \frac{p^4}{5\,rl^2\,rk^2} \quad (4)$$

```
Ordinary_Input_Demand_Function_x2 := simplify(-diff(ProfitStar, r2));
    #This is same as X2Star (Capital) from profit maximization.
```

$$Ordinary\_Input\_Demand\_Function\_x2 := \frac{2\,p^4}{5\,rl\,rk^3} \quad (5)$$

 # *1. c:*

```
Own_Price_Effect_Labor := diff(Ordinary_Input_Demand_Function_x1, r1);
```

$$Own\_Price\_Effect\_Labor := -\frac{2\,p^4}{5\,rl^3\,rk^2} \quad (6)$$

```
Own_Price_Effect_Capital := diff(Ordinary_Input_Demand_Function_x2, r2);
```

$$Own\_Price\_Effect\_Capital := -\frac{6\,p^4}{5\,rl\,rk^4} \quad (7)$$