 # Sec III Q6:

```
restart;
r1 := w; r2 := r; #wage for Labor, interest for Capital
```

$$r1 := w$$

$$r2 := r \quad (1)$$

```
costStar := y^3.(r1^(1/2).r2^(1/2))/256;
```

$$costStar := \frac{y^3 \sqrt{w}\, \sqrt{r}}{256} \quad (2)$$

 # 6. a: *They are minimizing cost since this is a indirect cost function . This is Constant Constrained Output Input Demand Function.*

```
InputDemandFunction_x1 := diff(costStar, r1); #Input demand function x1 (Labor)
```

$$InputDemandFunction\_x1 := \frac{y^3 \sqrt{r}}{512 \sqrt{w}} \quad (3)$$

```
InputDemandFunction_x2 := diff(costStar, r2); #input demand function x2 (Capital)
```

$$InputDemandFunction\_x2 := \frac{y^3 \sqrt{w}}{512 \sqrt{r}} \quad (4)$$

 # 6.b:

```
Marginal_cost := diff(costStar, y);
```

$$Marginal\_cost := \frac{3 y^2 \sqrt{w}\, \sqrt{r}}{256} \quad (5)$$

```
Supply_function := solve(Marginal_cost=p, y); #first one.
```

$$Supply\_function := \frac{16 \sqrt{3}\, \sqrt{\sqrt{w}\, \sqrt{r}\, p}}{3 \sqrt{w}\, \sqrt{r}}, -\frac{16 \sqrt{3}\, \sqrt{\sqrt{w}\, \sqrt{r}\, p}}{3 \sqrt{w}\, \sqrt{r}} \quad (6)$$

 # The price is equal to marginal cost in competitive market. The supply curve is the sum of marginal cost curves.

#6.c:

```
sr1 := r2·m
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$$sr1 := r\, m \quad (7)$$

```
m1 := solve(eval(InputDemandFunction_x1, [r1=sr1]) =x1, m);
```

$$m1 := \frac{y^6}{262144\, x1^2} \quad (8)$$

```
m2 := solve(eval(InputDemandFunction_x2, [r1=sr1]) =x2, m);
```

$$m2 := \frac{262144\, x2^2}{y^6} \quad (9)$$

```
Production_Function := solve(m1=m2, y);
    # This is required production function.Use positive function. = 8(x1^2·x2^2)^(1/12)
```

$$Production\_Function := 8 \left(x2^2\, x1^2\right)^{1/12}, -8 \left(x2^2\, x1^2\right)^{1/12}, 8 \sqrt{-\left(x2^2\, x1^2\right)^{1/6}},$$
$$-8 \sqrt{-\left(x2^2\, x1^2\right)^{1/6}}, 4 \sqrt{2} \left(2\, I \sqrt{3}\, \left(x2^2\, x1^2\right)^{1/3} - 2 \left(x2^2\, x1^2\right)^{1/3}\right)^{1/4}, \quad (10)$$

$$-4\sqrt{2}\left(2\,\mathrm{I}\sqrt{3}\,\left(x2^2\,x1^2\right)^{1/3}-2\left(x2^2\,x1^2\right)^{1/3}\right)^{1/4},$$

$$4\sqrt{-2\sqrt{2\,\mathrm{I}\sqrt{3}\,\left(x2^2\,x1^2\right)^{1/3}-2\left(x2^2\,x1^2\right)^{1/3}}},$$

$$-4\sqrt{-2\sqrt{2\,\mathrm{I}\sqrt{3}\,\left(x2^2\,x1^2\right)^{1/3}-2\left(x2^2\,x1^2\right)^{1/3}}},\ 4\sqrt{2}\left(-2\,\mathrm{I}\sqrt{3}\,\left(x2^2\,x1^2\right)^{1/3}\right.$$

$$\left.-2\left(x2^2\,x1^2\right)^{1/3}\right)^{1/4},\ -4\sqrt{2}\left(-2\,\mathrm{I}\sqrt{3}\,\left(x2^2\,x1^2\right)^{1/3}-2\left(x2^2\,x1^2\right)^{1/3}\right)^{1/4},$$

$$4\sqrt{-2\sqrt{-2\,\mathrm{I}\sqrt{3}\,\left(x2^2\,x1^2\right)^{1/3}-2\left(x2^2\,x1^2\right)^{1/3}}},$$

$$-4\sqrt{-2\sqrt{-2\,\mathrm{I}\sqrt{3}\,\left(x2^2\,x1^2\right)^{1/3}-2\left(x2^2\,x1^2\right)^{1/3}}}$$