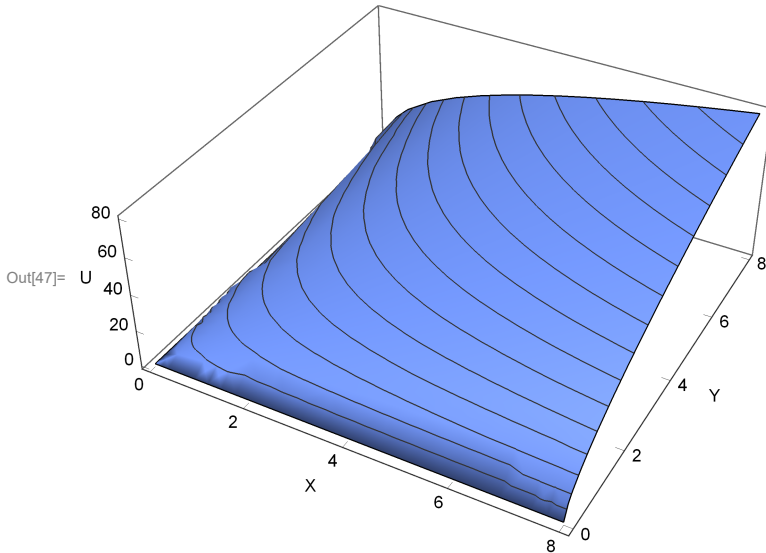```
In[8]:= U = 10 * (X^0.4 * Y^ (1 - 0.4))
```

```
Out[8]= 10 X^0.4 Y^0.6
```

```
In[47]:= Plot3D[U, {X, 0, 8}, {Y, 0, 8}, PlotTheme → "Business",
         AxesLabel → {"X", "Y", "U"}, Axes → True]
```

Out[47]=

```
L = (w * X + z * Y) - l * (10 * (X^0.4 * Y^ (1 - 0.4)) - Z)
```

```
Out[15]= w X + Y z - l (10 X^0.4 Y^0.6 - Z)
```

```
a = ∂_X L;
b = ∂_Y L;
c = ∂_l L;
Solve[{a == 0, b == 0, c == 0}, {X, Y, l}]
```

Domande compensate (l moltiplicatore; Z Utilità data)

$$X = \frac{0.078 \, z^{3/5} \, Z}{w^{3/5}};$$

$$Y = \frac{0.11 \, w^{2/5} \, Z}{z^{2/5}};$$

$$l \to 0.19 \, w^{2/5} \, z^{3/5}$$

Domande ordinarie (x esercizio)

$$X \to \frac{0.4 \, R}{w}, \quad Y \to \frac{0.6 \, R}{z}, \quad \mu \to \frac{5.10}{w^{2/5} \, z^{3/5}}$$

Matrice dei termini di sostituzione di Slutsky :

```
In[35]:= S = {{∂_w (0.078 z^{3/5} Z)/w^{3/5}, ∂_z (0.078 z^{3/5} Z)/w^{3/5}}, {∂_w (0.11 w^{2/5} Z)/z^{2/5}, ∂_z (0.11 w^{2/5} Z)/z^{2/5}}}
```

$$Out[35]= \left\{\left\{-\frac{0.0468 \, z^{3/5} \, Z}{w^{8/5}}, \frac{0.0468 \, Z}{w^{3/5} \, z^{2/5}}\right\}, \left\{\frac{0.044 \, Z}{w^{3/5} \, z^{2/5}}, -\frac{0.044 \, w^{2/5} \, Z}{z^{7/5}}\right\}\right\}$$

In[36]:= **MatrixForm[S]**

Out[36]//MatrixForm=

$$\begin{pmatrix} -\dfrac{0.0468\, z^{3/5}\, Z}{w^{8/5}} & \dfrac{0.0468\, Z}{w^{3/5}\, z^{2/5}} \\ \dfrac{0.044\, Z}{w^{3/5}\, z^{2/5}} & -\dfrac{0.044\, w^{2/5}\, Z}{z^{7/5}} \end{pmatrix}$$

In[37]:= **Minors[S]**

Out[37]= $\left\{ \left\{ -\dfrac{0.0468\, z^{3/5}\, Z}{w^{8/5}},\ \dfrac{0.0468\, Z}{w^{3/5}\, z^{2/5}} \right\},\ \left\{ \dfrac{0.044\, Z}{w^{3/5}\, z^{2/5}},\ -\dfrac{0.044\, w^{2/5}\, Z}{z^{7/5}} \right\} \right\}$

In[38]:= **Det[S]**

Out[38]= 0.

S è simmetrica e negativa semi definita