In[∘]:= `ClearAll;`

In[∘]:= `U = (c0^(1 - η)) / (1 - η) + ρ * (((I0 - c0) * (1 + r))^(1 - η)) / (1 - η)`

Out[∘]=

$$\frac{\rho\,((1+r)\,(\mathbb{i}_0 - c_0))^{1-\eta}}{1-\eta} + \frac{c_0^{1-\eta}}{1-\eta}$$

In[∘]:= `Uprime = D[U, c0]`

Out[∘]=

$$(-1-r)\,\rho\,((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta} + c_0^{-\eta}$$

In[∘]:= `Uprime == 0`

Out[∘]=

$$(-1-r)\,\rho\,((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta} + c_0^{-\eta} == 0$$

In[∘]:= `Uprime == (-1 - r) ρ (1 / ((1 + r) (i0 - c0))^η) + 1/c0^η`

Out[∘]=

True

In[∘]:= `Expand[%]`

Out[∘]=

True

In[∘]:= `c0 == I0 * (1 + r) / (((1 + r) / (1 + δ))^(1 / η) + (1 + r))`

Out[∘]=

$$c_0 == \frac{(1+r)\,\mathbb{i}_0}{1 + r + \left(\frac{1+r}{1+\delta}\right)^{\frac{1}{\eta}}}$$

In[∘]:= `c0 (((1 + r) / (1 + δ))^(1 / η) + (1 + r)) == I0 * (1 + r)`

Out[∘]=

$$\left(1 + r + \left(\frac{1+r}{1+\delta}\right)^{\frac{1}{\eta}}\right) c_0 == (1+r)\,\mathbb{i}_0$$

In[∘]:= `δ = (1 / ρ) - 1`

Out[∘]=

$$-1 + \frac{1}{\rho}$$

In[∘]:= `c0 (((1 + r) / (1 + δ))^(1 / η) + (1 + r)) == I0 * (1 + r)`

Out[∘]=

$$\left(1 + r + ((1+r)\,\rho)^{\frac{1}{\eta}}\right) c_0 == (1+r)\,\mathbb{i}_0$$

In[∘]:= `c0 (((1 + r) / (1 + δ))^(1 / η)) == I0 * (1 + r) - c0 * (1 + r)`

Out[∘]=

$$((1+r)\,\rho)^{\frac{1}{\eta}}\,c_0 == (1+r)\,\mathbb{i}_0 - (1+r)\,c_0$$

In[∘]:= $((1+r)\,\rho)^{\frac{1}{\eta}}\,c_0 == (1+r)\,(\mathbb{i}_0 - c_0)$

Out[∘]=

$$((1+r)\,\rho)^{\frac{1}{\eta}}\,c_0 == (1+r)\,(\mathbb{i}_0 - c_0)$$

In[ ]:=

$$((1+r)\,\rho)^{\frac{-\eta}{\eta}}\, c_0^{-\eta} == ((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta}$$

Out[ ]=

$$\frac{c_0^{-\eta}}{(1+r)\,\rho} == ((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta}$$

In[ ]:=

$$c_0^{-\eta} == ((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta}\,(1+r)\,\rho$$

Out[ ]=

$$c_0^{-\eta} == (1+r)\,\rho\,((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta}$$

In[ ]:=

$$c_0^{-\eta} - (1+r)\,\rho\,((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta} == 0$$

Out[ ]=

$$-((1+r)\,\rho\,((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta}) + c_0^{-\eta} == 0$$

In[ ]:=

$$-((1+r)\,\rho\,((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta}) + c_0^{-\eta} == (-1-r)\,\rho\,((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta} + c_0^{-\eta}$$

Out[ ]=

$$-((1+r)\,\rho\,((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta}) + c_0^{-\eta} == (-1-r)\,\rho\,((1+r)\,(\mathbb{i}_0 - c_0))^{-\eta} + c_0^{-\eta}$$

In[ ]:=

```
Expand[%]
```

Out[ ]=

```
True
```