$$x{:}y \in {}^{p}\mathbb{C}_q \ni u{:}v$$

$$\xi \underbrace{1_p - x\overset{*}{y}} | \xi x = \eta \overset{*}{v} | \eta \underbrace{1_q - \overset{*}{v}u}$$

$$\xi \underbrace{1_p - x\overset{*}{y}} = \eta \overset{*}{v}$$

$$\xi x = \eta \underbrace{1_q - \overset{*}{v}u}$$

$$\xi \underbrace{1_p - x\overset{*}{y}}\,\underbrace{1_p - u\overset{*}{v}} = \eta \overset{*}{v}\,\underbrace{1_p - u\overset{*}{v}} = \eta \underbrace{1_q - \overset{*}{v}u}\,\overset{*}{v} = \xi x \overset{*}{v}$$

$$\underbrace{1_p - x\overset{*}{y}}\,\underbrace{1_p - u\overset{*}{v}} - x\overset{*}{v} = \underbrace{1_p - x\overset{*}{y}}\,\underbrace{1_p - \overbrace{1_p - x\overset{*}{y}}^{-1} x\overset{*}{v}\,\overbrace{1_p - u\overset{*}{v}}^{-1}}\,\underbrace{1_p - u\overset{*}{v}} = \underbrace{1_p - x\overset{*}{y}}\,\underbrace{1_p - x^{y}\overset{*}{v}^{u}}\,\underbrace{1_p - u\overset{*}{v}}$$

$$\eta \underbrace{1_q - \overset{*}{v}u}\,\underbrace{1_q - \overset{*}{y}x} = \xi x \underbrace{1_q - \overset{*}{y}x} = \xi \underbrace{1_p - x\overset{*}{y}}\,x = \eta \overset{*}{v} x$$

$$\underbrace{1_q - \overset{*}{v}u}\,\underbrace{1_q - \overset{*}{y}x} - \overset{*}{v}x = \underbrace{1_q - \overset{*}{v}u}\,\underbrace{1_q - \overbrace{1_q - \overset{*}{v}u}^{-1} \overset{*}{v}x\,\overbrace{1_q - \overset{*}{y}x}^{-1}}\,\underbrace{1_q - \overset{*}{y}x} = \underbrace{1_q - \overset{*}{v}u}\,\underbrace{1_q - \overset{*}{v}^{u}x^{y}}\,\underbrace{1_q - \overset{*}{y}x}$$

$$x^{y} \perp u^{v} \Leftrightarrow$$

$$\text{inv } 1 - x\overset{*}{y} - v\overset{*}{u} + x\overset{*}{y}v\overset{*}{u} - x\overset{*}{u} = 1 - x\overset{*}{y} - v\overset{*}{u} - x\underbrace{1 - \overset{*}{y}v}\,\overset{*}{u}$$

$$\text{inv } 1 - \overset{*}{u}v - \overset{*}{y}x + \overset{*}{u}v\overset{*}{y}x - \overset{*}{u}x = 1 - \overset{*}{u}v - \overset{*}{y}x - \overset{*}{u}\,\underbrace{1 - v\overset{*}{y}}\,x$$

$$\Longrightarrow 0 = \xi \underbrace{1 - x\overset{*}{u}\overbrace{1 - v\overset{*}{u}}^{-1}\overbrace{1 - x\overset{*}{y}}^{-1}} = \xi \overbrace{\underbrace{1 - x\overset{*}{y}}\,\underbrace{1 - v\overset{*}{u}} - x\overset{*}{u}}\;\overbrace{1 - v\overset{*}{u}}^{-1}\;\overbrace{1 - x\overset{*}{y}}^{-1}$$

$$= \xi \underbrace{1 - x\overset{*}{y} - v\overset{*}{u} + x\overset{*}{y}v\overset{*}{u} - x\overset{*}{u}}\;\overbrace{1 - v\overset{*}{u}}^{-1}\;\overbrace{1 - x\overset{*}{y}}^{-1}$$

$$\Longrightarrow 0 = \eta \underbrace{1 - \overset{*}{u}x\overbrace{1 - \overset{*}{y}x}^{-1}\overbrace{1 - \overset{*}{u}v}^{-1}} = \eta \overbrace{\underbrace{1 - \overset{*}{u}v}\,\underbrace{1 - \overset{*}{y}x} - \overset{*}{u}x}\;\overbrace{1 - \overset{*}{y}x}^{-1}\;\overbrace{1 - \overset{*}{u}v}^{-1}$$

$$= \eta \underbrace{1 - \overset{*}{u}v - \overset{*}{y}x + \overset{*}{u}v\overset{*}{y}x - \overset{*}{u}x}\;\overbrace{1 - \overset{*}{y}x}^{-1}\;\overbrace{1 - \overset{*}{u}v}^{-1}$$