

$$\{F, G\} = \left\{ \frac{(-1 + e^x)(x+y)}{(-1 + e^{x+y})x}, \frac{e^x(-1 + e^y)(x+y)}{(-1 + e^{x+y})y} \right\} /. \{x \rightarrow cx, y \rightarrow cy\}$$

$$\left\{ \frac{(-1 + e^{cx})(cx + cy)}{c(-1 + e^{cx+cy})x}, \frac{e^{cx}(-1 + e^{cy})(cx + cy)}{c(-1 + e^{cx+cy})y} \right\}$$

**Series**[{F, G}, {c, 0, 1}]

$$\left\{ 1 - \frac{yc}{2} + O[c]^2, 1 + \frac{xc}{2} + O[c]^2 \right\}$$