

Solución

$$\frac{d}{dx} \left(\frac{r(x)x}{1 + \frac{r(x)-1}{K(x)}x} \right) = \frac{-x^2 K(x) \frac{d}{dx}(r(x)) + x^2 r(x)^2 \frac{d}{dx}(K(x)) - x^2 r(x) \frac{d}{dx}(K(x)) + x K(x)^2 \frac{d}{dx}(r(x)) + K(x)^2 r(x)}{(K(x) + x(r(x) - 1))^2}$$

Pasos

$$\frac{d}{dx} \left(\frac{r(x)x}{1 + \frac{r(x)-1}{K(x)}x} \right)$$

Aplicar la regla del cociente: $\left(\frac{f}{g}\right)' = \frac{f' \cdot g - g' \cdot f}{g^2}$

$$= \frac{\frac{d}{dx}(r(x)x) \left(1 + \frac{r(x)-1}{K(x)}x\right) - \frac{d}{dx} \left(1 + \frac{r(x)-1}{K(x)}x\right) r(x)x}{\left(1 + \frac{r(x)-1}{K(x)}x\right)^2}$$

$$\frac{d}{dx}(r(x)x) = x \frac{d}{dx}(r(x)) + r(x)$$

Mostrar pasos

$$\frac{d}{dx} \left(1 + \frac{r(x)-1}{K(x)}x\right) = \frac{r(x)-1}{K(x)} + \frac{x \left(K(x) \frac{d}{dx}(r(x)) - (r(x)-1) \frac{d}{dx}(K(x))\right)}{K(x)^2}$$

Mostrar pasos

$$= \frac{\left(x \frac{d}{dx}(r(x)) + r(x)\right) \left(1 + \frac{r(x)-1}{K(x)}x\right) - \left(\frac{r(x)-1}{K(x)} + \frac{x \left(K(x) \frac{d}{dx}(r(x)) - (r(x)-1) \frac{d}{dx}(K(x))\right)}{K(x)^2}\right) r(x)x}{\left(1 + \frac{r(x)-1}{K(x)}x\right)^2}$$

Simplificar $\frac{\left(x \frac{d}{dx}(r(x)) + r(x)\right) \left(1 + \frac{r(x)-1}{K(x)}x\right) - \left(\frac{r(x)-1}{K(x)} + \frac{x \left(K(x) \frac{d}{dx}(r(x)) - (r(x)-1) \frac{d}{dx}(K(x))\right)}{K(x)^2}\right) r(x)x}{\left(1 + \frac{r(x)-1}{K(x)}x\right)^2} : \frac{-x^2 K(x) \frac{d}{dx}(r(x)) + x^2 r(x)^2 \frac{d}{dx}(K(x)) - x^2 r(x) \frac{d}{dx}(K(x)) + x K(x)^2 \frac{d}{dx}(r(x)) + K(x)^2 r(x)}{(K(x) + x(r(x) - 1))^2}$

Mostrar pasos

$$= \frac{-x^2 K(x) \frac{d}{dx}(r(x)) + x^2 r(x)^2 \frac{d}{dx}(K(x)) - x^2 r(x) \frac{d}{dx}(K(x)) + x K(x)^2 \frac{d}{dx}(r(x)) + K(x)^2 r(x)}{(K(x) + x(r(x) - 1))^2}$$