In the case $r = s$ ☆ can be integrated

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to give

$$\log q^f - \log q^i = \lambda s \left(\frac{H}{\lambda}\right)^{\frac{s-1}{s}} (t^f - t^i) \Rightarrow$$

$$\log q^f = \log q^i + \lambda s \left(\frac{H}{\lambda}\right)^{\frac{s-1}{s}} (t^f - t^i) \Rightarrow$$

$$q^f = q^i \exp\left[\lambda s \left(\frac{H}{\lambda}\right)^{\frac{s-1}{s}} (t^f - t^i)\right]$$

But, in this case, $H = \lambda (q^i)^s (p^i)^s \Rightarrow$

$$H/\lambda = [(q^i)(p^i)]^s \;\&\; \left(\frac{H}{\lambda}\right)^{\frac{s-1}{s}} = (p^i)(q^i)^{s-1} \xRightarrow{\text{with } r=s}$$

$$\boxed{q^f = q^i \exp\left[\lambda r (q^i p^i)^{r-1} (t^f - t^i)\right]} \quad (1.4.24)$$

In a similar way integrating ☆☆ with $r = s \Rightarrow$

$$\boxed{p^f = p^i \exp\left[-\lambda r (q^i p^i)^{r-1} (t^f - t^i)\right]} \quad (1.4.25)$$

Note that in this case $q^f p^f = q^i p^i \Rightarrow$

$\lambda (q^f p^f)^s = \lambda (q^i p^i)^s$ as expected from

H conservation!