W3-8-2 Exact differential 12

Consider $dq = \left(\frac{RT}{P}\right) dp - RdT$

Is $dq \cdot \left(\frac{1}{T}\right)$ **an exact differential?**

$\frac{1}{T} \cdot dq = \frac{R}{P}dP - \frac{R}{T}dT$

$\left(\frac{\partial}{\partial T}\left(\frac{R}{P}\right)T\right)_P = 0$ and $\left(\frac{\partial}{\partial P}\left(-\frac{R}{T}\right)P\right)_T = 0$

Now the combined differentials are equal, so $\left(\frac{1}{T}\right) dq$ is an exact differential and $\left(\frac{1}{T}\right) dq$ is a state function.