(1)

$$\int_1^2 \frac{2(1+\ln Q)}{Q}\,dQ = \left| \begin{array}{l} \ln Q = t \\ \frac{1}{Q}\,dQ = dt \\ \begin{array}{c|cc} Q & 1 & 2 \\ \hline t & 0 & \ln 2 \end{array} \end{array} \right| =$$

$$= \int_0^{\ln 2} 2\cdot(1+t)\,dt = \int_0^{\ln 2} (2+2t)\,dt =$$

$$= \left[2t + 2\frac{t^2}{2} \right]_0^{\ln 2} = (2\cdot\ln 2 + \ln^2 2) - (0+0) =$$

$$= \underline{2\ln 2 + \ln^2 2} = \underline{\ln 2\cdot(2+\ln 2)}$$