

$$\begin{aligned} f(r, s) &= r \ln(r^7 + s^8) \quad \Rightarrow \\ f_r(r, s) &= r \cdot \frac{7r^6}{r^7 + s^8} + \ln(r^7 + s^8) \cdot 1 = \frac{7r^7}{r^7 + s^8} + \ln(r^7 + s^8), \\ f_s(r, s) &= r \cdot \frac{8s^7}{r^7 + s^8} + 0 = \frac{8rs^7}{r^7 + s^8} \end{aligned}$$