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d) $\log\left(x^4 \cdot \sqrt[3]{\frac{4x}{(y-x)^2}}\right) = \log\left(x^4 \cdot \left(\frac{4x}{(y-x)^2}\right)^{\frac{1}{3}}\right) = \log x^4 + \frac{1}{3} \cdot \log\left(\frac{4x}{(y-x)^2}\right) =$

$= 4 \log x + \frac{1}{3} \cdot (\log 4x - \log (y-x)^2) = 4 \log x + \frac{1}{3} \cdot (\log 4 + \log x - 2 \cdot \log(y-x)) =$

$= 4 \log x + \frac{1}{3} \log 4 + \frac{1}{3} \log x - \frac{2}{3} \log(y-x) = \frac{13}{3} \log x + \frac{1}{3} \log 4 - \frac{2}{3} \log(y-x)$