

28.9 1)

$$\begin{aligned} \frac{1}{2} + 2\log_4 \alpha - \frac{1}{4}\log_4 \beta + 3\log_4 \gamma &= \frac{1}{2}\log_4 4 + \log_4 \alpha^2 - \log_4 \beta^{\frac{1}{4}} + \log_4 \gamma^3 = \\ &= \log_4 4^{\frac{1}{2}} + \log_4 \alpha^2 - \log_4 \sqrt[4]{\beta} + \log_4 \gamma^3 = \log_4 \sqrt{4} + \log_4 \alpha^2 + \log_4 \gamma^3 - \log_4 \sqrt[4]{\beta} = \\ &= \log_4 2 \cdot \alpha^2 \cdot \gamma^3 - \log_4 \sqrt[4]{\beta} = \log_4 \frac{2\alpha^2\gamma^3}{\sqrt[4]{\beta}} \end{aligned}$$

28.9 2)

$$1 + 6\log_3 \alpha + \log_3 \beta - \frac{1}{2}\log_3 \gamma = \log_3 3 + \log_3 \alpha^6 + \log_3 \beta - \log \sqrt{\gamma} = \log \frac{(3 \cdot \alpha^6 \cdot \beta)}{\sqrt{\gamma}}$$

28.9 3)

$$\begin{aligned} 1 - \log 3 + \frac{2}{3}\log \alpha - \frac{5}{3}\log \beta &= \log 10 - \log 3 + \log \sqrt[3]{\alpha^2} - \log \sqrt[3]{\beta^5} = \\ &= \log \frac{10\sqrt[3]{\alpha^2}}{3\sqrt[3]{\beta^5}} = \log \frac{10\sqrt[3]{\alpha^2}}{3\sqrt[3]{\beta^3} \cdot \sqrt[3]{\beta^2}} = \frac{\log 10 \sqrt[3]{\frac{\alpha^2}{\beta^2}}}{3\beta} = \\ &= \frac{\log 10 \sqrt[3]{\frac{\alpha^2}{\beta^2}} \beta}{3\beta^2} = \frac{\log 10 \sqrt[3]{\frac{\alpha^2}{\beta^2} \sqrt[3]{\beta^3}}}{3\beta^2} = \frac{\log 10 \sqrt[3]{\alpha^2 \beta}}{3\beta^2} \end{aligned}$$

28.9 4)

$$\begin{aligned} \frac{1}{2} + \log \alpha + \frac{1}{2}\log \beta &= \log \sqrt{10} + \log \alpha + \log \sqrt{\beta} = \\ &= \log (\sqrt{10} \cdot \alpha \cdot \sqrt{\beta}) = \log (\alpha \sqrt{10\beta}) \end{aligned}$$