

28.10 1)

$$\begin{aligned} \alpha) \quad \ln \frac{e^{5\sqrt[3]{\omega^2}}}{x^3 y^2} &= \ln(e^{5\sqrt[3]{\omega^2}}) - \ln(x^3 y^2) = \ln e^5 + \ln \sqrt[3]{\omega^2} - (\ln x^3 + \ln y^2) = \\ &= \ln e + \ln \omega^{\frac{2}{3}} - 3 \ln x - 2 \ln y = 1 + \frac{2}{3} \ln \omega - 3\alpha - 2\beta = 1 + \frac{2}{3} \gamma - 3\alpha - 2\beta \end{aligned}$$

$$\begin{aligned} \beta) \quad \ln \sqrt{ex\sqrt{y\omega}} &= \ln(e x \sqrt{y\omega})^{\frac{1}{2}} = \frac{1}{2} \ln(e x \sqrt{y\omega}) = \frac{1}{2} (\ln e + \ln x + \ln \sqrt{y\omega}) = \frac{1}{2} \left[1 + \alpha + \ln(y\omega)^{\frac{1}{2}} \right] = \\ &= \frac{1}{2} \left[1 + \alpha + \frac{1}{2} \ln(y\omega) \right] = \frac{1}{2} \left[1 + \alpha + \frac{1}{2} (\ln y + \ln \omega) \right] = \frac{1}{2} \left[1 + \alpha + \frac{1}{2} (\beta + \gamma) \right] = \frac{2 + 2\alpha + \beta + \gamma}{4} \end{aligned}$$

28.10 2)

$$\ln \frac{x^2 \sqrt{y}}{e\omega} = \ln x^2 + \ln \sqrt{y} - \ln e - \ln \omega = 2 \ln x + \frac{1}{2} \ln y - \ln e - \ln \omega = 2\alpha + \frac{\beta}{2} - 1 - \gamma$$

28.10 3)

$$\ln \sqrt{x\sqrt[3]{y}} = \frac{1}{2} \ln x \sqrt[3]{y} = \frac{1}{2} (\ln x + \ln \sqrt[3]{y}) =$$

$$= \frac{1}{2} \left(\ln x + \ln y^{\frac{1}{3}} \right) = \frac{1}{2} \left(\ln x + \frac{1}{3} \ln y \right) = \frac{1}{2} \left(\alpha + \frac{\beta}{3} \right) = \frac{\alpha}{2} + \frac{\beta}{6}$$

28.10 4)

$$\ln(e^2 x^3 y^2 \omega) = \ln e^2 + \ln x^3 + \ln y^2 + \ln \omega =$$

$$= 2 \ln e + 3 \ln x + 2 \ln y + \ln \omega = 2 + 3\alpha + 2\beta + \gamma$$

28.10 5)

$$\ln \sqrt{x \sqrt{y \sqrt{\omega \sqrt{e}}}} = \ln \left(x \left(y \left(\omega (e)^{\frac{1}{2}} \right)^{\frac{1}{2}} \right)^{\frac{1}{2}} \right)^{\frac{1}{2}} =$$

$$= \frac{1}{2} \ln \left(x \left(y \left(\omega (e)^{\frac{1}{2}} \right)^{\frac{1}{2}} \right)^{\frac{1}{2}} \right)^{\frac{1}{2}} = \frac{1}{2} \ln x + \frac{1}{2} \cdot \ln \left(y \left(\omega e^{\frac{1}{2}} \right)^{\frac{1}{2}} \right)^{\frac{1}{2}} =$$

$$= \frac{1}{2} \ln x + \frac{1}{4} \ln \left(y (\omega e)^{\frac{1}{2}} \right)^{\frac{1}{2}} = \frac{1}{2} \ln x + \frac{1}{4} \ln y + \frac{1}{4} \ln \left(\omega e^{\frac{1}{2}} \right)^{\frac{1}{2}} =$$

$$= \frac{1}{2} \ln x + \frac{1}{4} \ln y + \frac{1}{8} \ln \left(\omega e^{\frac{1}{2}} \right) = \frac{1}{2} \ln x + \frac{1}{4} \ln y + \frac{1}{8} \ln \omega + \frac{1}{8} \ln e^{\frac{1}{2}} =$$

$$= \frac{1}{2} \ln x + \frac{1}{4} \ln y + \frac{1}{8} \ln \omega + \frac{1}{8} \cdot \frac{1}{2} = \frac{\alpha}{2} + \frac{\beta}{4} + \frac{\gamma}{8} + \frac{1}{16} =$$

$$= \frac{8\alpha + 4\beta + 2\gamma + 1}{16}$$