28.6 1)

α) $\log x^2y = \log x^2 + \log y = 2\log x + \log y = 2\alpha + \beta$

β) $\log\dfrac{y^7}{x^3} = \log y^7 - \log x^3 = 7\log y - 3\log x = 7\beta - 3\alpha$

γ) $\log\dfrac{1}{\sqrt[11]{x^8}} = \log x^{-\frac{8}{11}} = -\dfrac{8}{11}\log x = -\dfrac{8}{11}\alpha$

δ) $\log\dfrac{1000}{xy} = \log 1000 - \log xy \overset{\log 1000=3}{=} 3 - (\log x + \log y) = 3 - (\alpha + \beta) = 3 - \alpha - \beta$

28.6 2)

$\log xy = \log x + \log y = \alpha + \beta$

28.6 3)

$\log\dfrac{x}{y} = \log x - \log y = \alpha - \beta$

28.6 4)

$\log x^4 = 4\log x = 4\alpha$

28.6 5)

$\log y^7 = 7\log y = 7\beta$

28.6 6)

$\log x^3y^2 = \log x^3 + \log y^2 = 3\log x + 2\log y = 3\alpha + 2\beta$

28.6 7)

$\log x^5y^7 = \log x^5 + \log y^7 = 5\log x + 7\log y = 5\alpha + 7\beta$

28.6 8)

$\log x^8y^4 = \log x^8 + \log y^4 = 8\log x + 4\log y = 8\alpha + 4\beta$

28.6 9)

$\log\dfrac{x^4}{y^3} = \log x^4 - \log y^3 = 4\log x - 3\log y = 4\alpha - 3\beta$

28.6 10)

$\log\dfrac{y^6}{x^5} = \log y^6 - \log x^5 = 6\log y - 5\log x = 6\beta - 5\alpha$

28.6 11)

$\log\dfrac{y^5}{x^{14}} = \log y^5 - \log x^{14} = 5\log y - 14\log x = 5\beta - 14\alpha$

28.6 12)

$\log\dfrac{x^9}{y^4} = \log x^9 - \log y^4 = 9\log x - 4\log y = 9\alpha - 4\beta$

28.6 13)

$\log(xy)^5 = 5\log xy = 5(\log x + \log y) = 5\alpha + 5\beta$

28.6 14)

$\log(x^2y^3)^5 = 5\log x^2y^3 = 5(\log x^2 + 3\log y^3) =$

$= 5\left(2\log x + 3\log y\right) = 5\left(2\alpha + 3\beta\right) = 10\alpha + 15\beta$

28.6 15)

$\log\left(x^4 y^5\right)^2 = 2\log x^4 y^5 = 2\left(\log x^4 + \log y^5\right) =$

$= 2\left(4\log x + 5\log y\right) = 2\left(4\alpha + 5\beta\right) = 8\alpha + 10\beta$

28.6 16)

$\log\left(\frac{y}{x}\right)^6 = 6\log\left(\frac{y}{x}\right) = 6\left(\log y - \log x\right) = 6\alpha - 6\beta$

28.6 17)

$\log\left(\frac{x^7}{y^3}\right)^4 = 4\log\frac{x^7}{y^3} = 4\left(\log x^7 - \log y^3\right) = 4\left(7\log x - 3\log y\right) = 4\left(7\alpha - 3\beta\right) = 28\alpha - 12\beta$

28.6 18)

$\log\frac{1}{x} = \log 1 - \log x = 0 - \log x = -\alpha$

28.6 19)

$\log\frac{1}{y^5} = \log 1 - \log y^5 = 0 - 5\log y = -5\alpha$

28.6 20)

$\log\sqrt{x} = \log x^{\frac{1}{2}} = \frac{1}{2}\log x = \frac{\alpha}{2}$

28.6 21)

$\log\sqrt[3]{y^2} = \log y^{\frac{2}{3}} = \frac{2}{3}\log y = \frac{2\beta}{3}$

28.6 22)

$\log\frac{1}{\sqrt[7]{x^4}} = \log\frac{1}{x^{\frac{4}{7}}} = \log x^{-\frac{4}{7}} = -\frac{4}{7}\log x = -\frac{4\alpha}{7}$

28.6 23)

$\log\left(x^2\sqrt{y}\right) = \log x^2 + \log\sqrt{y} = \log x^2 + \log y^{\frac{1}{2}} = 2\log x + \frac{1}{2}\log y = 2\alpha + \frac{\beta}{2}$

28.6 24)

$\log\sqrt{x^3 y^5} = \log\left(x^3 y^5\right)^{\frac{1}{2}} = \frac{1}{2}\log x^3 y^5 = \frac{1}{2}\left(\log x^3 + \log y^5\right) =$

$= \frac{1}{2}\left(3\log x + 5\log y\right) = \frac{1}{2}\left(3\alpha + 5\beta\right) = \frac{3\alpha}{2} + \frac{5\beta}{2}$

28.6 25)

$\log\frac{y^4}{\sqrt{x}} = \log y^4 - \log\sqrt{y} = 4\log y - \log x^{\frac{1}{2}} = 4\log y - \frac{1}{2}\log x = 4\beta - \frac{\alpha}{2}$

28.6 26)

$\log 10x = \log 10 + \log x = 1 + 7\log x = 1 + \alpha$

28.6 27)

$\log\frac{4}{100} = \log y - \log 100 = \beta - 2$

28.6 28)

$$\log 100x^4y^5 = \log 100 + \log x^4y^5 = 2 + \log x^4 + \log y^5 =$$

$$= 2 + 4\log x + 5\log y = 2 + 4\alpha + 5\beta$$

28.6 29)

$$\log \frac{10x^5}{y^7} = \log 10x^5 - \log y^7 = \log 10 + \log x^1 - \log y^7 = 1 + 5\log x - 7\log y = 1 + 5\alpha - 7\beta$$

28.6 30)

$$\log \sqrt{10x^3y^2} = \log \left(10x^3y^2\right)^{\frac{1}{2}} = \frac{1}{2}\log 10x^3y^2 = \frac{1}{2}\left(\log 10 + \log x^3 + \log y^2\right) =$$

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

28.6 31)

$$\log \frac{x^x}{\sqrt{1000y^7}} = \log x^3 - \log \sqrt{1000y^7} = 3\log x - \frac{1}{2}\log 1000y^7 =$$

$$= 3\log x - \frac{1}{2}\left(\log 1000 + \log y^7\right) = 3\log x - \frac{1}{2}\left(3 + 7\log y\right) =$$

$$= 3\alpha - \frac{3}{2} + \frac{7\beta}{2} = \frac{6\alpha - 3 + 7\beta}{2}$$