

Β ΛΥΚΕΙΟΥ ΑΛΓΕΒΡΑ

28.11 1)

$$\begin{aligned} \frac{2 + \log_5 36 - \frac{2}{3} \log_5 8}{\frac{1}{2} + \log_5 \sqrt{45}} &= \frac{2 \log_5 5 + \log_5 36 - \log_5 8^{\frac{2}{3}}}{\frac{1}{2} \log_5 5 + \log_5 \sqrt{45}} = \frac{2 \log_5 5^2 + \log_5 36 - \log_5 4}{\log_5 5^{\frac{1}{2}} + \log_5 \sqrt{45}} = \\ &= \frac{\log_5 \frac{25 \cdot 36}{4}}{\log_5 (\sqrt{5} \cdot \sqrt{45})} = \frac{\log_5 (25 \cdot 9)}{\log_5 \sqrt{5 \cdot 45}} = \frac{\log_5 225}{\log_5 \sqrt{225}} = \frac{\log_5 225}{\frac{1}{2} \log_5 225} = \frac{1}{\frac{1}{2}} = 2 \end{aligned}$$

28.11 2)

$$\begin{aligned} \frac{\log 6000 - 2}{\log \sqrt{3} + \log 2 + \log \sqrt{5}} &= \frac{\log 6000 - \log 10^2}{\log (\sqrt{3} \cdot 2 \cdot \sqrt{5})} = \\ &= \frac{\log \left(\frac{6000}{100} \right)}{\log (2\sqrt{15})} = \frac{\log 60}{\log \sqrt{60}} = \frac{\log 60}{\log (60)^{\frac{1}{2}}} = \frac{1}{\frac{1}{2}} = 2 \end{aligned}$$

28.11 3)

$$\begin{aligned} \frac{2 \log_3 2 + \log_3 18 - 2}{\log_3 12 - 1} &= \frac{\log_3 2^2 + \log_3 18 - \log_3 3^2}{\log_3 12 - \log_3 3} = \\ &= \frac{\log_3 \left(\frac{4 \cdot 18}{9} \right)}{\log_3 \left(\frac{12}{3} \right)} = \frac{\log_3 60}{\log_3 4} = \frac{\log_3 2^3}{\log_3 2^2} = \frac{3 \log_3 2}{2 \log_3 2} = \frac{3}{2} \end{aligned}$$

28.11 4)

$$\begin{aligned} \frac{\frac{1}{2} \log_4 25 + \log_4 40 - \frac{3}{2}}{\log_4 10 - \frac{1}{2}} &= \frac{\log_4 \sqrt{25} + \log_4 40 - \log_4 4^{\frac{3}{2}}}{\log_4 10 - \log_4 4^{\frac{1}{2}}} = \\ &= \frac{\log_4 5 + \log_4 40 - \log_4 8}{\log_4 10 - \log_4 2} = \frac{\log_4 \left(\frac{5 \cdot 40}{8} \right)}{\log_4 \frac{10}{2}} = \\ &= \frac{\log_4 25}{\log_4 5} = \frac{\log_4 5^2}{\log_4 5} = \frac{2 \log_4 5}{\log_4 5} = 2 \end{aligned}$$

28.11 5)

$$\begin{aligned} \frac{\log \sqrt{125} + \log \sqrt{27} - \log \sqrt{8}}{\log 15 - \log 2} &= \frac{\log 5^{\frac{3}{2}} + \log 3^{\frac{3}{2}} - \log 2^{\frac{3}{2}}}{\log 15 - \log 2} = \\ &= \frac{\frac{3}{2} (\log 5 + \log 3 - \log 2)}{\log \frac{15}{2}} = \frac{\frac{3}{2} \log \left(\frac{5 \cdot 3}{2} \right)}{\log \frac{15}{2}} = \frac{3}{2} \end{aligned}$$

