

1/23/13 Whiteboard Problems

If $\log_2(5) = 2.3$ and $\log_2(3) = 1.6$ find the following:

① $\log_2(25)$
 $\log_2(5^2)$

$2\log_2(5) = 2(2.3) = \boxed{4.6}$

② $\log_2(125)$
 $\log_2(5^3)$

$3(2.3) = \boxed{6.9}$

③ $\log_2\left(\frac{6}{5}\right)$

$\log_2(6) - \log_2(5)$

$\log_2(3 \cdot 2) - 2.3$

$\log_2(3) + \log_2(2) - 2.3$
 $1.6 + 1 - 2.3$
 $2.6 - 2.3 = \boxed{.3}$

④ $\log_2(15)$
 $\log_2(3 \cdot 5)$

$\log_2(3) + \log_2(5)$

$1.6 + 2.3$

$\boxed{3.9}$

⑤ $\log_2(45)$
 $\log_2(9 \cdot 5)$

$\log_2(9) + \log_2(5)$

$\log_2(3^2) + 2.3$

$2(1.6) + 2.3$

$3.2 + 2.3 = \boxed{5.5}$

⑥ $\log_2\left(\frac{1}{5}\right)$

$\log_2(1) - \log_2(5)$

$0 - 2.3 = \boxed{-2.3}$

Express in terms of $\log_3(M)$ and $\log_3(N)$.

⑦ $\log_3\left(\frac{M^2}{9N}\right)$

$\log_3(M^2) - \log_3(9N)$

$2\log_3(M) - (\log_3(9) + \log_3(N))$

$2\log_3(M) - 2 - \log_3(N)$

⑧ $\log_3\left(\frac{1}{MN}\right)$

⑨ $\log_3(M \cdot \sqrt[4]{N^3})$

$\log_3(M) + \log_3 N^{3/4}$

$\log_3(M) + \frac{3}{4}\log_3(N)$

⑩ $\log_3\left(\frac{M}{N}\right)^7$

$\log_3\left(\frac{M^7}{N^7}\right)$

$\log_3(M^7) - \log_3(N^7)$

$7\log_3(M) - 7\log_3(N)$

$\log_3\left(\frac{1}{MN}\right)$

$\log_3(1) - \log_3(MN)$

$0 - (\log_3 M - \log_3(N))$

$-\log_3 M + \log_3(N)$