

Math 105 TOPICS IN MATHEMATICS
SOLUTION FOR MOCK QUIZ – IX (03/30)

March 30 (Mon), 2015

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[I] (2pts) $3^x = 7^{\boxed{(\log_7 3) x}}$. $10^x = e^{\boxed{(\ln 10) x}}$.

[II] (2pts) $2 = 6^{\boxed{\log_6 2}}$. $10 = e^{\boxed{\ln 10}}$.

[III] (2pts)

(a) $\frac{1}{\log_5 3} = \log_{\boxed{3}} \boxed{5}$. (b) $\frac{1}{\log_{13} 24} = \log_{\boxed{24}} \boxed{13}$.

[IV] (4pts) (1) $\log_3 81 = 4$. (2) $\log_{10} 10000 = 4$.

(3) $\log_5 \frac{1}{125} = -3$. (4) $\log_4 \frac{1}{256} = -4$.

[V] (2pts)

(1) $\log_2 2^{\sqrt{2}} = \sqrt{2}$. (2) $e^{\ln 5} = 5$.

[VI] (2pts)

(1) $\frac{\log_2 9}{\log_2 4} = \log_{\boxed{4}} \boxed{9}$. (2) $\frac{\log_3 10}{\log_3 e} = \ln \boxed{10}$.

[VII] (8pts) (1) $(\ln 75) - (\ln 25) = \ln \boxed{3}$.

(2) $6 \ln 2 = \ln \boxed{64}$.

(3) $\ln 125 = \boxed{3} (\ln 5)$.

(4) $\ln \sqrt[5]{729} = \frac{\boxed{6}}{\boxed{5}} (\ln 3)$.

(5) $e^{(\ln 3)+(\ln 17)} = 51$.

(6) $e^{5(\ln 2)} = 32$.

(7) $\ln 6^{\frac{1}{\ln 6}} = 1$.

(8) $6^{\frac{1}{\ln 6}} = e$.