

# HW 69

p405

1. change of base

2.  $\frac{\ln x}{\ln a}$

4. c

5. a

6. b

7. a)  $\frac{\log 16}{\log 5}$       b)  $\frac{\ln 16}{\ln 5}$

8. a)  $\frac{\log 47}{\log 3}$       b)  $\frac{\ln 47}{\ln 3}$

15.  $\frac{\log 7}{\log 3} = 1.771$

17.  $\frac{\log 4}{\log 1/2} = -2$

45.  $\ln 4 + \ln x$

46.  $\log_3 10 + \log_3 z$

47.  $4 \log_8 x$

48.  $\log_{10} y - \log_{10} z$

49.  $\frac{\log_5 5}{1 - \log_5 x}$

50.  $\log_6 1 - 3 \log_6 z$

$$\boxed{-3 \log_6 z}$$

51.  $\ln z^{1/2} = 1/2 \ln z$

52.  $\ln t^{1/3} = 1/3 \ln t$