

## Math 150 Week in Review 6 Answer Key

1. (a) Start with graph of  $(\frac{1}{4})^x$ . Then shift left 1, reflect across  $x$ -axis, shift up 2.  
 Domain:  $(-\infty, \infty)$   
 Range:  $(-\infty, 2)$   
 Horizontal Asymptote:  $y = 2$ 

(b) Start with graph of  $\log_3 x$ . Then reflect across  $y$ -axis, shift down 1.  
 Domain:  $(-\infty, 0)$   
 Range:  $(-\infty, \infty)$   
 Vertical Asymptote:  $x = 0$
2.  $(-\infty, 3) \cup (6, \infty)$
3. (a)  $\ln 3 + 5 \ln x + 2 \ln(x + 2) - \frac{1}{4} \ln y$   
 (b)  $\frac{1}{5}(\log 4 + \log x + \log y)^2(\log 7 + \log(x + 2))$
4. (a)  $\log \frac{\sqrt[3]{x-7}}{y^2(z^2+16)^5}$   
 (b)  $\frac{\ln(\frac{y}{x})}{\ln(x^4y)}$
5. (a)  $\frac{3}{2}$   
 (b) 6  
 (c) -2  
 (d) 4  
 (e)  $\approx 1.7712$
6. (a)  $x = -\frac{1}{12}$   
 (b)  $x = 16$   
 (c)  $x = \frac{1}{3} \left( \frac{\log 2}{\log 6} + 7 \right) = \frac{1}{3} \log_6 2 + \frac{7}{3}$   
 (d)  $x = 4e^3 - 1$   
 (e)  $x = \frac{\ln(\frac{3}{2})}{-20} = \frac{\ln 3 - \ln 2}{-20}$   
 (f)  $x = 7$ ; ( $x = -3$  is extraneous)  
 (g)  $x = \frac{\log \frac{1}{72}}{\log(\frac{4}{3})} = \frac{-\log 72}{\log \frac{4}{3}} = \frac{\log 72}{\log \frac{3}{4}} = -\log_{4/3} 72 = \log_{3/4} 72$  (These are all the same thing.)  
 (h)  $x = 5$ ; ( $x = 2$  is extraneous)  
 (i)  $x = \frac{\ln 5}{2}$   
 (j)  $x = 7$ ; ( $x = -6$  is extraneous)
7. (a) \$2219.69  
 (b)  $t \approx 15.39$  yr  
 (c)  $t \approx 15.27$  yr