

M\$6 Exam 1 Review Sheet

1. Fill in the chart below.

Function	Domain	Range
$y = 2^x$		
$y = \log_2 x$		
$y = \log_x 2$		

2. If $\log 5 = x$ and $\log 8 = y$, express $\log \sqrt{\frac{25}{8}}$ in terms of x and y .

3. If $\log 30 = b$, then $(b-1)^2$ is equivalent to
 (1) $(\log 29)^2$ (2) $(\log 3)^2$ (3) $2(\log 30 - 1)$ (4) $\log 899$

4. If $\log_5 x = 2$, what is the value of \sqrt{x} ?
 (1) 25 (2) $2^{\frac{2}{5}}$ (3) 5 (4) $\sqrt{5}$

5. Solve algebraically for z : $27^{2z-8} = \left(\frac{1}{9}\right)^{3z}$

6. In the equation $y = 33(1.09^x)$, y represents the number of cans of soda drank in a certain town in thousands and x represents the number of years since 1992. Find the year when the people of the town drank 50 thousand cans of soda for the first time.

7. The relationship between the relative size of an earthquake, S , and the measure of the earthquake on the Richter scale, R , is given by the equation $\log S = R$. If an earthquake measured 3.2 on the Richter scale, what was its relative size to the *nearest hundredth*?
8. The scientists in a laboratory company raise amebas to sell to schools for use in biology classes. They know that one ameba divides into two amebas every hour and that the formula $t = \log_2 N$ can be used to determine how long in hours, t , it takes to produce a certain number of amebas, N . Determine, to the *nearest tenth of an hour*, how long it takes to produce 10,000 amebas if they start with one ameba.
9. Solve for x : $\log_3(7x + 4) - \log_3 2 = 2 \log_3 x$
10. Solve for x : $2 \log_2 x - \log_2(x - 1) = 3$
11. The magnitude (R) of an earthquake is related to its intensity (I) by $R = \log\left(\frac{I}{T}\right)$, where T is the threshold below which the earthquake is not noticed. If the intensity is doubled, its magnitude can be represented by
- (1) $2(\log I - \log T)$ (2) $\log 2 + \log I - \log T$ (3) $\log I - \log T$ (4) $2 \log I - \log T$
12. A pharmaceutical company has tested a new time-release drug with code name R-543. Experimental studies have found that a 40-milligram dose of the drug leaves the bloodstream at a rate of 4% per hour.
- a) What is the number of milligrams, to the *nearest tenth* of a milligram, of R-543 left in the bloodstream 12 hours after it is taken?
- b) The *half-life* of a drug is the amount of time it takes for one-half of the drug to be eliminated or broken down by the body. Find the half-life of R-543 to the *nearest hundredth* of an hour.