Solving exponential and logarithmic equations Class _____ Name _____ Date ____

Solve each equation for x. In solving these equations, try to combine and simplify using properties of logarithms and exponents. Then try to use an inverse function to remove the exponential or logarithmic expression. After finding roots, be sure to check them in the original equation to make sure that they make sense.

	Problem	Work	Answer
1	[Example] $\log_2(x-2) + \log_2(x+2) = \log_2(5)$	$\log_2(x^2-4) = \log_2(5)$. Apply $2^{(\,)}$ to both sides. $(x^2-4) = 5$. $(x^2-9) = 0$. Factoring, $(x-3)(x+3) = 0$. Roots are x=3, x=-3. The root x= -3 does not check; it makes both terms on the left-hand side undefined. The root x=3 does check: $\log_2(3-2) + \log_2(3+2) =?\ \log_2(5)$ $\log_2(1) + \log_2(5) =?\ \log_2(5)$ $0 + \log_2(5) = \log_2(5)$? YES	x=3
2	$3^{x^2} \cdot 3^5 = 3^{6x}$ (this means 3 to the power x^2 times 3 to the power 5 equals 3 to the power 6x)		
3	$\log(x+5)+\log(x+2)=\log(-4)+\log(x+5)$		
4	$\log(\sqrt{(x)}) = (1/3)\log(125)$		
5	$\log_3(x) + \log_9(x) = \log_3(8)$		
6	$4\log_7 x = \log_7(2) + \log_7(x^2-0.5)$		