Algebra 2 S2 Name: _____ Block: _____

Log Properties 3 (GREEN)

Solve each equation. Pick 2 equations from each column to solve and do the rest for more practice.

1. $log_3(x+3) - log_3(x+4) = 5$

$\log_3 \frac{x+3}{x+4} = 5$

$3^5 = \frac{x+3}{x+4}$

$243 = \frac{x+3}{x+4}$

$243(x+4) = x+3$

$243x + 972 = x+3$

$242x = -969$

$x = \frac{-969}{242}$

2. $log_7(x+2) - log_7(x+3) = 4$

$\log_7 \frac{x+2}{x+3} = 4$

$7^4 = \frac{x+2}{x+3}$

$2401 = \frac{x+2}{x+3}$

$2401(x+3) = x+2$

$2401x + 7203 = x+2$

$2400x = -7201$

$x = \frac{-7201}{2400}$

3. $log_2(x-6) - log_2(x+8) = 8$

$\log_2 \frac{x-6}{x+8} = 8$

$2^8 = \frac{x-6}{x+8}$

$256 = \frac{x-6}{x+8}$

$256(x+8) = x-6$

$256x + 2048 = x-6$

$255x = -2054$

$x = \frac{-2054}{255}$

4. $log_4(x-4) - log_4(x+7) = 9$

$\log_4 \frac{x-4}{x+7} = 9$

$4^9 = \frac{x-4}{x+7}$

$262144 = \frac{x-4}{x+7}$

$262144(x+7) = x-4$

$262144x + 1835008 = x-4$

$262143x = -1835012$

$x = \frac{-1835012}{262143}$

5. $log_2(x) + log_2(x+4) = 5$

$\log_2 x(x+4) = 5$

$2^5 = x^2+4x$

$32 = x^2+4x$

$x^2+4x-32=0$

$x^2+4x-32=0$

$1 \cdot 32$

$2 \cdot 16$

$4 \cdot 8$

$(x-4)(x+8)=0$

$x = 4, -8$

6. $log_3(x) + log_3(x-2) = 8$

$\log_3 x(x-2) = 8$

$3^8 = x^2-2x$

$6562 = x^2-2x$

$x^2-2x-6562=0$

$x^2-2x-6562=0$

QF

$x = -80.012, 82.012$

7. $log_4(x) + log_4(x+5) = 2$

$\log_4 x(x+5) = 2$

$4^2 = x^2+5x$

$16 = x^2+5x$

$x^2+5x-16=0$

$x^2+5x-16=0$

QF

$x = -7.217, 2.217$

8. $log_7(x) + log_7(x-3) = 4$

$\log_7 x(x-3) = 4$

$7^4 = x^2-3x$

$2401 = x^2-3x$

$x^2-3x-2401=0$

$x^2-3x-2401=0$

QF

$x = -47.523, 50.523$