Properties of Logs Practice

1. $\log_3(7x+3) = \log_3(5x+9)$

2. $\log_7(x-2) + \log_7(x+3) = \log_7 14$

3. $\log_2(5x+7) = 5$

4. $\ln(4x-1) = 3$

5. $\log_3(9x+2) = 4$

6. $\log_4 x + \log_4(x-12) = 3$

7. $\log_4(2x+1) = \log_4(x+2) - \log_4 3$

8. $\log_6(x+4) + \log_6(x-2) = \log_6(4x)$

Properties of Logs Practice

1. $\log_3(7x+3) = \log_3(5x+9)$

$7x+3 = 5x+9$

$2x = 6$

$x = 3$

2. $\log_7(x-2) + \log_7(x+3) = \log_7 14$

$(x-2)(x+3) = 14$

$x^2 - x - 6 = 14$

$x^2 - x - 20 = 0$

$(x+4)(x-5) = 0$

$x = -4, 5$ (-4 gives us a negative log value so only 5 wor

$x = 5$

3. $\log_2(5x+7) = 5$

$5x+7 = 2^5$

$5x+7 = 32$

$5x+7 = 32$

$x = 5$

4. $\ln(4x-1) = 3$

$4x-1 = e^3$

$4x-1 \approx 20.085537$

$x \approx 5.271384$

5. $\log_3(9x+2) = 4$

$9x+2 = 3^4$

$9x+2 = 81$

$x = \frac{79}{9}$

6. $\log_4 x + \log_4(x-12) = 3$

$\log_4(x(x-12)) = 3$

$x(x-12) = 3$ (-4 gives us a negative solution so only 16 works)

$x^2 - 12x = 4^3$

$x^2 - 12x - 64 = 0$

$(x+4)(x-16)$

$x = -4$ or 16 $x = 16$

7. $\log_4(2x+1) = \log_4(x+2) - \log_4 3$

$\log_4(2x+1) = \log_4\left(\frac{x+2}{3}\right)$

$2x+1 = \frac{x+2}{3}$

$6x+3 = x+2$

$5x = -1$

$x = -\frac{1}{5}$ (when substituted back into log equation a negative is produced)

no solution

8. $\log_6(x+4) + \log_6(x-2) = \log_6(4x)$

$\log_6((x+4)(x-2)) = \log_6(4x)$

$x^2 + 2x - 8 = 4x$

$(x+2)(x-4) = 0$

$x = -2, 4$ (-2 gives us a negative solution so only 4 works)

$x = 4$

Properties of Logs

Product rule: $\log_a(xy) = \log_a x + \log_a y$

$\log_7 11x = \log_7 11 + \log_7 x$

quotient rule: $\log_a\left(\frac{x}{y}\right) = \log_a x - \log_a y$

$\log_6 \frac{2}{3} = \log_6 2 - \log_6 3$

Power rule: $\log_x y^p = p\log_x y$

$\log_6 4^9 = 9\log_6 4$

Change of base: $\log_x y = \frac{\log x}{\log y}$

$\log_2 17 = \frac{\log 17}{\log 2} \approx 4.086$

equality rule if $\log_a x = \log_a y$, then $x = y$

$\log_8 (x+1) = \log_8 2x$

$x + 1 = 2x$

$1 = x$

Ex $\log_3 x^2 y$

$\log_3 x^2 + \log_3 y$

$2\log_3 x + \log_3 y$

Ex $4\log_7 (x+2) - 3\log_7 (x-5)$

$\frac{4\log_7 (x+2)}{3\log_7 (x-5)}$

$\frac{\log_7 (x+2)^4}{\log_7 (x-5)^3}$