$\log_b m + \log_b n = \log_b(mn)$

$\log_b m - \log_b n = \log_b\left(\frac{m}{n}\right)$

$\log_b m^p = p\log_b m$

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7. $\log_6(x-2) + \log_6(x+3) = \log_6 14$

$\log_6(x^2+x-6) = \log_6 14$

$x^2+x-6 = 14$

$\quad -14 \quad -14$

$x^2+x-20 = 0$

$$x = \frac{-1 \pm \sqrt{1^2-4(1)(-20)}}{2(1)}$$

$$x = \frac{-1 \pm \sqrt{81}}{2} = \frac{-1 \pm 9}{2} = \frac{-1+9}{2}, \frac{-1-9}{2}$$

$x = 4, \cancel{-5}$

8. $\log_6 x - \log_6(x-5) = \log_6 2$

$\log_6\left(\frac{x}{x-5}\right) = \log_6 2$

$\cancel{(x-5)}\frac{x}{\cancel{x-5}} = 2(x-5)$

$x = 2x-10$

$-x = -10$

$x = 10$

9. $\log_2 4x - \log_2 5 = 6$

$\log_2 \frac{4x}{5} = 6$

change to exp. form

$(5)2^6 = \frac{4x}{5}(5)$

$320 = 4x$

$80 = x$

$\log_b x = y$

$b^y = x$

10. $\log_4 x + \log_4(x-6) = 2$

$\log_4(x^2-6x) = 2$

$4^2 = x^2-6x$

$-16 \qquad -16$

$0 = x^2-6x-16$

x^2	
	-16

$x = \frac{6 \pm \sqrt{(-6)^2-4(1)(-16)}}{2(1)}$

$= \frac{6 \pm \sqrt{100}}{2} = \frac{6 \pm 10}{2} = \frac{16}{2}, \frac{-4}{2}$

$x = 8, \cancel{-2}$

$0 = (x-8)(x+2)$

$x-8=0 \quad x+2=0$

$x=8 \quad x=-2$