6. $2\log_7 x = \log_7 27 + \log_7 3$

$\cancel{\log_7(-9)}$

$\log_7 x^2 = \log_7 81$

$\sqrt{x^2} = \pm\sqrt{81}$

$x = \pm 9$

$x = 9$

$\log_7(-9)$

$7^n = -9$

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

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

$x^2 + x - 6 = 14$

$-14 \qquad -14$

qual. form. $1x^2 + 1x - 20 = 0$

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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

$x = \dfrac{-1 \pm \sqrt{81}}{2} = \dfrac{-1 \pm 9}{2} = \dfrac{-1+9}{2}$ or $\dfrac{-1-9}{2}$

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

factoring

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

$x - 4 = 0 \quad x + 5 = 0$

$x = 4 \quad x = -5$

-20

$5 \quad -4$

	x	5
x	x^2	$5x$
-4	$-4x$	-20

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

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

$\log_b x = y$

$\downarrow$ exp. form

$b^y = x$

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

$320 = 4x$

$80 = x$

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

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

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

$-16 \qquad -16$

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

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

$x = \frac{6 \pm \sqrt{100}}{2}$

$x = \frac{6 \pm 10}{2} = \frac{6+10}{2}$ or $\frac{6-10}{2}$

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

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

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

$x = 8 \quad x = -2$

-16

$-8 \quad 2$

	x	-8
x	x^2	$-8x$
2	$2x$	-16