1/24/13   Solving log equations

① $2\log(6x) - \log(3x) = \log(36)$

$\log(6x)^2 - \log(3x) = \log(36)$

$\log(36x^2) - \log(3x) = \log(36)$

$\log\left(\dfrac{36x^2}{3x}\right) = \log(36)$

$\log(12x) = \log(36)$

$\dfrac{12x}{12} = \dfrac{36}{12}$

$\boxed{x = 3}$

② $\log(2) + \log(x+5) - \log(2) = \log(36)$

$\log(2 \cdot (x+5)) - \log(2) = \log(36)$

$\log(2x+10) - \log(2) = \log(36)$

$\log\left(\dfrac{2x+10}{2}\right) = \log(36)$

$\dfrac{2x+10}{2} = 36$

$\dfrac{2x}{2} + \dfrac{10}{2} = 36$

$x + 5 = 36$

$\ -5\quad -5$

$\boxed{x = 31}$

③ $\log(x+2) - \log(2) = \log(24)$

$\log\left(\dfrac{x+2}{2}\right) = \log(24)$

$2\left(\dfrac{x+2}{2}\right) = (24)2$

$x + 2 = 48$

$-2\quad\ -2$

$\boxed{x = 46}$

④ $\log_2(x) + \log_2(x) = -3$

$\log_2(x \cdot x) = -3$

$\log_2(x^2) = -3$

$(2^{-3})^{1/2} = (x^2)^{1/2}$

$x = 2^{-3/2}$

$\boxed{x = \dfrac{1}{2^{3/2}}}$