Exercise with log

$\log_{\frac{1}{2}}(x-3) = \log_2 4$

$\log_{\frac{1}{2}}(x-3) = 2$

$x - 3 = (\frac{1}{2})^2 = \frac{1}{4}$

$x = 3\frac{1}{4}$

$\log_{(x-1)} 9 = 2$

$(x-1)^2 = 9$

$x - 1 = 3$ $\quad$ $x-1 = -3$

$x = 4$ $\quad$ $x = -2$ not possible

$\log_4 8$ = ?

$\log_4 8 = \frac{\log 8}{\log 4} = \frac{\log_2 8}{\log_2 4} = \frac{3}{2}$

$\log_{x^2} x^3$ = ?

$\log_{x^2} x^3 = \frac{logx^3}{logx^2} = \frac{\log_x x^3}{\log_x x^2} =$

$= \frac{3\log_x x}{2\log_x x} = \frac{3.1}{2.1} = \frac{3}{2}$

$\log_2(x-y) = 1$

$\log_6(x+y) = 1$

$x - y = 2^1 = 2$

$x + y = 6^1 = 6$

$2x = 8$

$X = 4$; $\quad$ $4 + y = 6$

$y = 6 - 4 = 2$

$\log_X(5X-6) = 2$

$5X - 6 = X^2$

$x^2 - 5x + 6 = 0$

$(x-3)(x-2) = 0$

$x \neq 1$

$5x - 6 > 0$

$x > 1.2$

$x - 3 = 0$ $\quad$ $x - 2 = 0$

$x = 3$ $\quad$ $x = 2$