**2** **(a)** Solve the equation $\log_3(x-2) = \log_3(12-x) - 2$. [4]

**(b)** Given that $(2\log_5 y)(\log_x 5) = 8$, express $y$ in terms of $x$. [3]

**2** **(a)** Solve the equation $\log_3(x-2) = \log_3(12-x) - 2$. [4]

$\log_3(x-2) = \log_3(12-x) - 2$ → $2\log_3 3$

$\log_3(x-2) = \log_3(12-x) - \log_3 3^2$

$\log_3(x-2) = \log_3\left(\frac{12-x}{9}\right)$ → compare

$x-2 = \frac{12-x}{9}$

$9(x-2) = 12-x$

$10x = 30$

$x = 3$ // Ans

**(b)** Given that $(2\log_5 y)(\log_x 5) = 8$, express $y$ in terms of $x$. [3]

$\left(\frac{2\log_x y}{\log_x 5}\right)(\log_x 5) = 8$ → change of base formula

$\log_x y = 4$

$y = x^4$