4 **(a)** Write $3+4\log_2 a-\log_2 b$ as a single base 2 logarithm. [3]

(b) Solve the equation $\lg x = 4\log_x 10$. [4]

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5 The polynomial p is such that $\mathrm{p}(x) = ax^3 + bx^2 - 19x + c$, where a, b and c are integers. It is given that $x+2$ is a factor of $\mathrm{p}(x)$. When $\mathrm{p}(x)$ is divided by $x+1$ the remainder is 20.

(a) Show that $7a - 3b = 39$. [3]

It is also given that when $\mathrm{p}'(x)$ is divided by $x-1$ the remainder is 1.

(b) Find the values of a, b and c. [3]