10 **(a)** Given the simultaneous equations

$$\lg x + 2\lg y = 1,$$
$$x - 3y^2 = 13,$$

(i) show that $x^2 - 13x - 30 = 0$. [4]

(ii) Solve these simultaneous equations, giving your answers in exact form. [2]

(b) Solve the equation $\log_a x + 3\log_x a = 4$, where a is a positive constant, giving x in terms of a. [5]