Homework 23, due October 30

(1) Use the Pohlig-Hellman algorithm to compute $L_2(28)$ for $p = 37$. Show your work.
(2) Use the Baby Step, Giant Step method to compute $L_3(11)$ for $p = 401$. Show your work.
(3) Alice and Bob use the ElGamal cryptosystem with $p = 62501$ and $\alpha = 2$. Bob tells Alice that $\beta = 236$. Use the Pohlig-Hellman algorithm to compute Bob's secret exponent x. Next, Alice sends the ciphertext $(r, t) = (27629, 58211)$ to Bob. What is Alice's (numerical) message?