1.(a) m=253, n=220

(b) d=249

(c) 22 isn't relatively prime to 220, nor is 64, and so neither can be e. 37 and 229 are both fine.

2. (a) TALK NOON first becomes 24 5 16 15 18 19 19 18

Then, 24^63 (mod 253), 5^63 (mod 253), 16^63 (mod 253)...

(b)162, 191, 81, 42, 200, 83, 83, 200

3. d=23, 4^23 MOD 91 = 23, 57^23 MOD 91 = 8, 13^23 MOD 91 = 13, 42^23 MOD 91 = 35

X I N ?
(There was a computational error in this one, so it didn’t turn out to be English. The first letter should have been encrypted as 38 and decrypted as M, and the last letter encrypted to be 61 so decrypted to be D.)

4. 0003^17 (mod 2599)= 1051, 0012^17 (mod 2599)=1159.
(Note: There was also an error in the factorization of n. It should have been 2464=2^5*7*11.)