Number Theory Homework #2

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To be handed in on Monday, November 21, 2016.

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1. Find the inverses of all residues x=11,12,...,20 mod 41.
2. Compute Euler's φ-function for 121 ≦ n ≦ 130.
3. Find **all** solutions of the congruences

   a) 6x = 3 mod 29, b) 6x =12 mod 54, c) 6x = 5 mod 54.
4. Find the solutions of the following systems of congruences:

   a) x = a mod 17, x = b mod 8. b) x=a mod 17, x=b mod 7.

   c) x = A mod 3, x = B mod 5, x= C mod 7
5. a) Compute the continued fraction expansion √5 and of √7.

   b) What number has the continued fraction expansion [1;2,2,2,2,.....] ?
6. Show that there are infinitely many primes of the form 4k+3.

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Course homepage: http://www.math.tau.ac.il/~rudnick/courses/int_numth.html