CS 165 Lab 2 Assignment

October 7, 2012

Find a solution for the following:

1. $29 \mod 3$
2. $51 \equiv 7 \pmod{x}$
3. $4x + 2 \equiv 5 \pmod{7}$
4. Is $x = -1$ a valid solution for problem 3? Why or why not?

Solve the following without calculating the initial sum/product/exponent explicitly:

5. $(243 + 2583) \mod 3$
6. $(248 \cdot 177 \cdot 299 \cdot 492 \cdot 16) \mod 7$
7. $(377)^5 \mod 11$
8. $(1056)^{27} \mod 13$

Solve:

9. gcd(48,84)
10. gcd(17,3214)
11. gcd(51,36)
12. gcd(87,51)
13. gcd(138,87)
14. gcd(215,138)
15. gcd(353,215)
16. gcd(568,353)

Prove:

17. There exists exactly one even prime.

18. If $x|a$ and $x|b$, then $x|(a+b)$

19. $a * b \bmod n = (a \bmod n)(b \bmod n)$

Note: I *highly recommend* that you re-write every proof from class. Ensure that you understand it and can reproduce it on an exam.