

Assignment 6

1. Using the fact that $4 \times 15 = 60$, solve the equation $15x + 12 \equiv 3 \pmod{59}$. Your solution should be a number x computed “modulo 59”. It should be an integer between 0 and 58.
2. Find the first power of 3 that is congruent to 1 modulo 11, and use this information to find out the value of $3^{2014} \pmod{11}$.
3. True or False: For every y we can solve the equation $5x \equiv y \pmod{23}$ for x .
4. True or False: For every prime $p > 3$ the equation $x^2 + 1 \equiv 0 \pmod{p}$ has a solution.
5. Find an x such that $x \equiv 10 \pmod{13}$ and $x \equiv 5 \pmod{59}$.