Assignment 4, due February 4

Problem 1

Solve the congruency

 $151x \equiv 95 \pmod{252}$

Problem 2

Solve the system of congruences

 $x^2 \equiv 1 \pmod{4}, \qquad x^3 \equiv 6 \pmod{15}.$

Problem 3

Solve the system of congruences

 $5x \equiv 8 \pmod{12}, \qquad 7x \equiv 16 \pmod{18}.$

Problem 4

Solve the congruency

 $x^{239} + 10x^{17} + 4x^{14} + 3x + 2 \equiv 0 \pmod{10}$

Problem 5

Find the smallest natural number n with the following property: If a and 10 are coprime, then $a^n \equiv 1 \pmod{10}$.