

## Math 1350 Problem Set 2

1. Solve the following linear congruences:

(a)  $25x \equiv 15 \pmod{29}$

(b)  $5x \equiv 2 \pmod{17}$

(c)  $6x \equiv 15 \pmod{21}$

(d)  $36x \equiv 8 \pmod{102}$ , where  $102 = 2 \cdot 3 \cdot 17$ .

2. Solve the following set of simultaneous solutions. Remember there may be more than 1 solution.

$$x \equiv 5 \pmod{6}$$

$$x \equiv 4 \pmod{11}$$

$$x \equiv 3 \pmod{17}$$

3. A band of 17 pirates stole a sack of gold coins. When they tried to divide the fortune into equal portions, 3 coins remained. In the ensuing brawl over who should get the extra coins, one pirate was killed. The wealth was redistributed, but this time an equal division left 10 coins. Again an argument developed in which another pirate was killed. But now the total fortune was evenly distributed among the survivors. What was the least number of coins that could have been stolen?