

4. (10 pts) List ten “types” of cubic equations *not reducible to lower degree*, like Khayyami.

5. (10 pts) Find a number that leaves a remainder of 10 when divided by 137 and a remainder of 0 when divided by 60.

6. (30 pts) Solve three of the following. Indicate which ones you have chosen. Do not do more than three.
- Several people purchase in common one item. If each person paid 8 coins, the surplus is 3. If each paid 7, the deficiency is 4. How many people were there, and what was the price of the item?
 - One-third of a herd of elephants and three times the square root of the remaining part of the herd were seen on a mountain slope, and in a lake was seen a male elephant along with three female elephants. How many were the elephants?
 - Suppose 10 is divided into two parts, each of which is divided by the other, and the sum of the quotients equals the square root of 5. Find the parts.
 - Two men have some denarii. The first said to the second, if you will give me one of your denarii, then mine will equal yours. The other responded, and if you will give me one of your denarii, then I will have ten times as many as you. How many does each man have?
 - I am owed 3240 florins. If the debtor pays me 1 florin the first day, 2 florins the second day, 3 florins the third day and so on, how many days does it take to pay off the debt.

7. (6 pts) What does “co” stand for in Italian algebra?

8. (14 pts) Show that $\sqrt[3]{18 + \sqrt{325}} + \sqrt[3]{18 - \sqrt{325}} = 3$. Hint: the fact that you know the answer makes the process easier.