

Chinese Remainder Theorem

0.1

Find the exact number of soldiers given that you know there are between 500 and 600 soldiers

$$x \equiv 2 \pmod{3} \quad x \equiv 3 \pmod{5} \quad x \equiv 2 \pmod{7}$$

0.2

Find all solutions of

$$x^2 \equiv 1 \pmod{144}$$

0.3

Find a solutions to

$$x \equiv 88 \pmod{6}$$

$$x \equiv 100 \pmod{15}$$

0.4

Solve the following simultaneous linear congruences

$$2x \equiv 1 \pmod{5} \quad 3x \equiv 9 \pmod{6} \quad 4x \equiv 1 \pmod{7}$$

0.5

Suppose we want to solve simultaneously the follow three congruences:

$$x \equiv 2 \pmod{5}$$

$$x \equiv 4 \pmod{7}$$

$$x \equiv 1 \pmod{9}$$