

1. *Find all solutions to the following system of linear congruences:*

$$x \equiv 0 \pmod{2}$$

$$x \equiv 0 \pmod{3}$$

$$x \equiv 1 \pmod{5}$$

$$x \equiv 6 \pmod{7}$$

Your answer here...

2. Find all solutions of the congruence  $x^2 + 6x - 31 \equiv 0 \pmod{72}$ .

Your answer here...

3. *Show that if  $a, b, c \in \mathbb{Z}$  and  $(a, b) = 1$ , then there exists an integer  $n \in \mathbb{Z}$  so that  $(an + b, c) = 1$*

Your answer here...