1 Determine all solutions to the congruence \( x \equiv 2 \pmod{3} \)
2 Determine all solutions to the congruence \( x \equiv 2 \pmod{7} \)
3 Determine all solutions to the congruence \( x \equiv 2 \pmod{21} \)
4 Determine all solutions to the congruence \( 4x \equiv 2 \pmod{21} \)
5 Determine all solutions to the congruence \( 4x \equiv 2 \pmod{7} \)

A zero divisor is a non-zero residue that divides zero. For example, 2 is a zero divisor modulo 6 because \( 2 \cdot 3 \equiv 0 \pmod{6} \). (This congruence also tells us that 3 is a zero divisor modulo 6)
6 Find all zero divisors modulo 21
7 Describe all \( n \) so that zero divisors exist modulo \( n \).

The order of an residue, \( a \), modulo \( n \) is the least positive integer \( h \) so that \( a^h \equiv 1 \pmod{n} \).
8 Determine the order of 2 modulo 11.
9 For each residue, \( a \), modulo 11, determine the exponent \( g \) so that \( 2^g \equiv a \pmod{11} \)
10 Determine the order of 4 modulo 11.

A primitive root modulo \( n \) is a residue \( a \) so that the order of \( a \) modulo \( n \) is \( \phi(n) \).
11 Determine all primitive roots modulo 11.
12 Determine all primitive roots modulo 55.
13 Determine \( g \) so that \( 2^g \equiv 17 \pmod{55} \).