b. Find the reciprocal of 111 in Z_{200}

111^{-1}

$(111 \times K) \mod 200 = 1$

$1 = 5 \cdot 200 + -9 \cdot 111$

$b = -9 \mod 200 = 191$

$111 \otimes 191 = (111 \cdot 191) \mod 200 = 21201 \mod 200 = 1$

Therefore, $111^{-1} = 191$

6. Find all integers x which leave a remainder 4 when divided by 5 and a remainder 7 when divided by 11. That is, solve the following equations simultaneously

$x \mod 5 = 4$ and $x \mod 11 = 7$