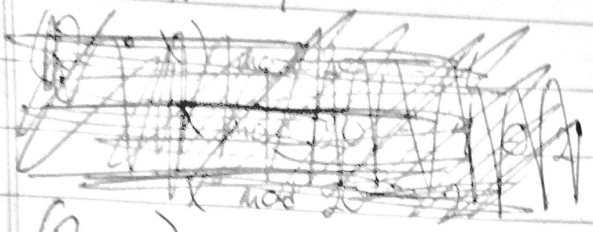
HW 2pt 083

b. $2 \otimes x = 4$



$(2 \cdot x) \bmod 20 = 4$

$(2 \cdot 2) \bmod 20 = 4$

~~$(2 \cdot 2) \bmod 20 = 4$~~

$(2 \cdot 12) \bmod 20 = 4$, $(2 \cdot 22) \bmod 20 = 4$

$12 = 10 \cdot 1 + 2$

$x = 10(c_{0,1,2\ldots}) + 2$

c. $2 \otimes x = 3$

$(2 \cdot x) \bmod 20 = 3$

In order for equation to have a solution, it must generate an odd number, however the equation as written will only result in even values for $(2 \cdot x)$. Thus, we cannot get a result $= 3$. So, the equation, has no solutions.