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History of Math (640:437:01)
Homework 1

(1) if $f(x) = (0,0)$, then x is divisible by n_1 and n_2. $(n_1, n_2) = 1$
x would be a multiple of $n_1 n_2$ because x is less than $n_1 n_2$.
If $(x_1) = (x_2)$ then $f(x_1 - x_2) = 0$, therefore $x_1 - x_2 = 0$ and $x_1 = x_2$. This proves that the function is one-to-one. Since f is one to one, there are the same number of elements from $[0, n_1 - 1]$ and $[0, n_2 - 1]$., so it must be onto and have an inverse

(2) $\frac{1}{2} + \frac{1}{3} + \frac{1}{5} = \frac{1(3)(5)}{30} + \frac{1(2)(5)}{30} + \frac{1(2)(3)}{30} = \frac{31}{30}$

$EF\left(\frac{31}{30}\right)$ $x = \frac{31}{30}$ $\frac{1}{x} = \frac{30}{31}$ $\text{ceil}\left(\frac{30}{31}\right) = 1$

$EF\left(\frac{31}{30}\right) = 1 + \frac{1}{30}$

We are able to divide it equally into 30th slices. It would be more simple to use the set of $\frac{1}{2} + \frac{1}{3} + \frac{1}{5}$ because it would be more simple despite it not being as equal as the $\frac{1}{30}$th slices

(3) (a) $x \equiv 2 \pmod 3$
$x \equiv 6 \pmod 7$
$14 = 2(7)$
$14 + 6 = 20$
$20 \equiv 6 \pmod 7$
$20 \equiv 2 \pmod 3$
$20,\ 20 + 21$
$20,\ 41$

(b) $x \equiv 1 \pmod 3$
$x \equiv 4 \pmod 7$.
$4 \equiv 1 \pmod 3$
$4 \equiv 4 \pmod 7$
$4,\ 4 + 21$
$4,\ 25$

(c) $x \equiv 0 \pmod 3$
$x \equiv 2 \pmod 7$
$9 \equiv 0 \pmod 3$
$9 \equiv 2 \pmod 7$
$2,\ 2 + 21$
$2,\ 23$