$x \equiv a_1 \mod m_1$
$x \equiv a_2 \mod m_2$
$\vdots$
$x \equiv a_n \mod m_n$

m_i's all coprime

$x =$

$x \equiv 2 \mod 3$
$x \equiv 3 \mod 5$
$x \equiv 4 \mod 7$

1a

Given: $a = (2,0,0) \mod 3, \mod 5, \mod 7$
$b = (0,3,0)$
$c = (0,0,4)$

Found → $a+b+c = x$

$a+b+c \mod 3 \equiv 2+0+0 \equiv 2 \mod 3$
$a+b+c \mod 5 \equiv 0+3+0 \mod 5$

1b Find a.

$a = 2 \times a^* \times 5 \times 7 = 2 \cdot 35 a^* \equiv 2 \mod 3$

$a = 2(35a^*) \equiv 2 (1 \mod 3)$

$35a^* \equiv 1 \mod 3$, $a' = 35a^*$

$35a^* \equiv 1 \mod 3$, a'

$a^* \equiv 35^{-1} \equiv 2^{-1} \equiv 2 \mod 3$

$a = 2 \times 35 \times 2 = 140 \equiv 2$

$140 \mod 3 \equiv 2$
$140 \mod 5 \equiv 0$

$a' = (1,0,0)$
$a = 2a'$

$a \mod 3 \equiv 2a' \mod 3 \equiv 2$
$a \mod 5 \equiv 2a' \mod 5 \equiv 2 \cdot 0 = 0$

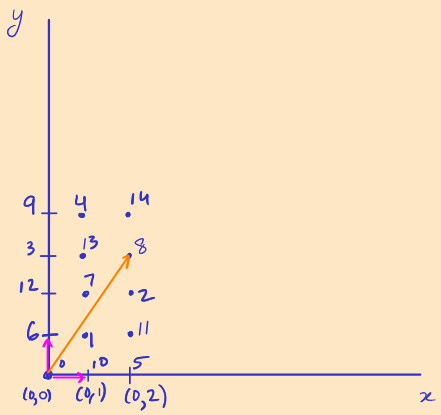
$x \equiv a_1 \mod m_1$
$x \equiv a_2 \mod m_2$

$a \mod m_1 = a_1$
$a \mod m_2 = 0$

$a_1 m_2 \cdot (m_2^{-1} (\mod m_1)) \mod m_1$
$\equiv a_1 \mod m_1$

$3^{302} \mod 385$

$3^{302} \mod 11$
$\equiv (3^{10})^{30} \times 3^2 \mod 11$
$3^{10} \equiv 1 \mod 11$ FLT
$\equiv 9 \mod 11$



(a, b)
$x \equiv 2 \mod 3$
$x \equiv 3 \mod 5$

$2 \cdot 10 + 3 \cdot 6 = 20 + 18 = 38 = 8 \mod 15$