Pg 3

3. In $(\mathbb{Z}_{25}^*, \otimes)$, the set $H = \{1, 6, 11, 16, 21\}$ is a subgroup

a. How many elements are in $\mathbb{Z}_{25}^*$

$\{1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 16, 17, 18, 19, 21, 22, 23, 24\}$

$|\mathbb{Z}_{25}^*| = 20$

b. How many equivalence classes of the congruence (mod H) relation are there in $\mathbb{Z}_{25}^*$?

$|H| = 5$, so the number of equivalence classes in the set is 5

c. Find the equivalence classes of the (mod H) relation

$[1] = \{1, 6, 11, 16, 21\}$
$[2] = \{2, 12, 22, 7, 17\}$
$[3] = \{3, 18, 8, 23, 13\}$
$[6] = \{6, 11, 16, 21, 1\}$
$[9] = \{9, 4, 24, 19, 14\}$