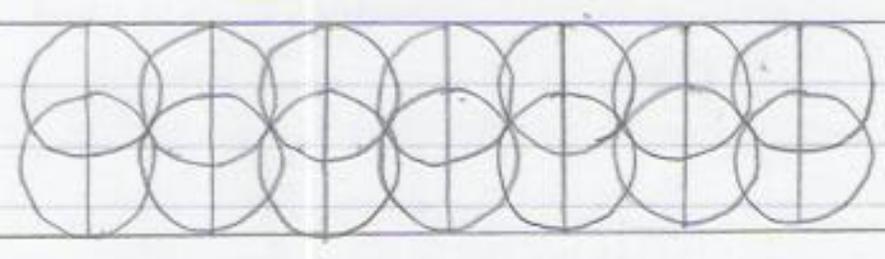


of the frieze in vertical axes at  $(n + 1/4)a$  or  $(n + 3/4)a$ . The frieze pattern then becomes.



3/3  
25  
25

which is a frieze pattern of type 6.

4a) i) If  $a^3$  commutes with  $b$ ,  $a^3b = ba^3$   
 $ba^3 = (ba)a^2 = a^4ba^2 = a^4(ba)a = a^3ba = a^3(ba)$   
 $= a^3a^2b = a^3(a^2b) = a^3(ab) = a^3b$

2/2

$a^0$  commutes with  $b$  since  $a^0b = ba^0 = (a^0 = a)$   
so  $b = b$  which is as plain as day. (P.T.O)

$ba^6 = (ba^3)a^3 = a^3ba^3 = a^3(ba^3) = a^6b$   
(since  $a^3b = ba^3$ ), hence  $a^6$  commutes with  $b$ .  
 $a^0, a^3, a^6$  commute with  $b$ .

2/2

ii) By definition  $e$  commutes with all  $g \in G$ .

$b^2a^3 = b(ba^3) = ba^3b = (ba^3)b = a^3b^2$

$a^3$  commutes with  $b^2$  (since it commutes with  $b$ )  
and  $a^3$  commutes with  $a^i$  for  $i = 1, \dots, 8$

$a^3 \in H$  ( $a^3b = ba^3$  from a)i)  $\checkmark$  Since  $a^3$  and  $a^6$  commute with the generators of  $G$  then therefore commute will all of  $G$

$ba^6 = (ba^3)a^3 = a^3ba^3 = a^3(ba^3) = a^6b$   
 $b^2a^6 = b(ba^3)a^3 = ba^3ba^3 = (ba^3)(ba^3) = a^3ba^3b$   
 $= a^3(ba^3)b = a^3a^3bb = a^6b^2$

$a^6a^i = a^ia^6 \therefore a^6 \in H$

$b \in H$ ? No since  $ba \neq ab$