

⑨

b) The rotations with centre  $D$  which are symmetries of  $L$  are

$r((-1,0),0)$  (the identity rotation)

$r((-1,0),\pi/2) = t(-1,0)r(\pi/2)t(1,0) = t(-1,1)r(\pi/2)$

$r((-1,0),\pi) = t(-1,0)r(\pi)t(1,0) = t(-2,0)r(\pi)$

$r((-1,0),3\pi/2) = t(-1,0)r(3\pi/2)t(1,0) = t(-1,-1)r(3\pi/2)$

Which is a rotation composed with a translation, but  $r = r(\pi/2)$ . Conjugate symmetries are the same geometrically and a rotation is not geometrically the same as a rotation composed with a translation.  $X$ ?

 $9/2$ 

If  $x \in \Gamma(L)$  then  $xrx^{-1}$  is a conjugate of  $r$ .

$xrx^{-1}$  is a rotation but with centre  $x(O)$ .

However, since  $x \in \Gamma(L)$ ,  $x(O)$  must be a lattice point and  $D$  is not a lattice point.