(1) The purpose of the diagram below is to illustrate the identity $T[G] = T \ast G \ast T^{-1}$: indeed you can see how the sequential application of translation $T^{-1}$, glide reflection $G$, and translation $T$ to the point $A$ is equivalent to applying the glide reflection $T[G]$, the *image* of the glide reflection $G$ under the translation $T$.

Repeat the process to the given point $B$. 
(2) The purpose of the diagram below is to illustrate the identity \( G[T] = G\ast T\ast G^{-1} \): indeed you can see how the sequential application of glide reflection \( G^{-1} \), translation \( T \), and glide reflection \( G \) to the point A is equivalent to applying the translation \( G[T] \), the image of the translation \( T \) under the glide reflection \( G \).

Repeat the process to the given point B.
(3) Determine the following glide reflections: \( T_1 \ast G, T_2 \ast G, T_3 \ast G, \)
\( T_1[G], T_2[G], T_3[G]. \)

What observation could you make based on your answers above?
(4) Determine the composition $G \ast T$ of the translation $T$ followed by the glide reflection $G$ empirically, by finding $G \ast T(A)$ and $G \ast T(B)$. 
(5) Show, using the unit A, that the horizontal translation \( t \) may be obtained in (at least) two different ways as composition of other isometries: \( G_2 \cdot G_1^{-1} \) (\( G_1^{-1} \) followed by \( G_2 \)) and \( G_3^{-1} \cdot T \cdot G_1^{-1} \) (\( G_1^{-1} \) followed by \( T \) followed by \( G_3^{-1} \)). Are the two methods really different? Comment as appropriate.