1. Find a formula for the linear fractional transformation that rotates the triangle $\langle 0/1, 1/2, 1/1\rangle$ to $\langle 1/1, 0/1, 1/2\rangle$.

2. Find the linear fractional transformation that reflects the Farey diagram across the edge $\langle 1/2, 1/3\rangle$ (so in particular, the transformation takes $1/2$ to $1/2$ and $1/3$ to $1/3$).

3. Find a formula for the linear fractional transformation that reflects the upper half-plane version of the Farey diagram across the vertical line $x = 3/2$.

4. Find an infinite periodic strip of triangles in the Farey diagram such that the transformation $\left(\begin{smallmatrix} 0 & 1 \\ 1 & 2 \end{smallmatrix}\right)$ is a glide-reflection along this strip and the transformation $\left(\begin{smallmatrix} 0 & 1 \\ 1 & 2 \end{smallmatrix}\right)\left(\begin{smallmatrix} 0 & 1 \\ 1 & 2 \end{smallmatrix}\right) = \left(\begin{smallmatrix} 1 & 2 \\ 2 & 5 \end{smallmatrix}\right)$ is a translation along this strip.

5. Let T be an element of $LF(\mathbb{Z})$ with matrix $\left(\begin{smallmatrix} a & b \\ c & d \end{smallmatrix}\right)$. Show that the composition $T\left(\begin{smallmatrix} -1 & 0 \\ 0 & 1 \end{smallmatrix}\right)T^{-1}$ is the reflection across the edge $\langle a/c, b/d\rangle = T(\langle 1/0, 0/1\rangle)$.

For each of the remaining six problems, compute the value of the given periodic or eventually periodic continued fraction by first drawing the associated infinite strip of triangles, then finding a linear fractional transformation T in $LF(\mathbb{Z})$ that gives the periodicity in the strip, then solving $T(z) = z$.

6. $\overline{{}^{1}\!\nearrow_{2} + {}^{1}\!\nearrow_{5}}$

7. $\overline{{}^{1}\!\nearrow_{2} + {}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{1}}$

8. $\overline{{}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{2}}$

9. $2 + \overline{{}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{4}}$

10. $2 + \overline{{}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{4}}$

11. ${}^{1}\!\nearrow_{1} + {}^{1}\!\nearrow_{1} + \overline{{}^{1}\!\nearrow_{2} + {}^{1}\!\nearrow_{3}}$