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 \( \begin{pmatrix} 0 & 1 \\ 1 & 2 \end{pmatrix} \) is a glide-reflection along this strip and the transformation \( \begin{pmatrix} 0 & 1 \\ 1 & 2 \end{pmatrix} \begin{pmatrix} 0 & 1 \\ 1 & 2 \end{pmatrix} = \begin{pmatrix} 1/2 & 1 \\ 2 & 5 \end{pmatrix} \) is a translation along this strip.

5. Let \( T \) be an element of \( LF(\mathbb{Z}) \) with matrix \( \begin{pmatrix} a & b \\ c & d \end{pmatrix} \). Show that the composition \( T \left( \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix} \right) T^{-1} \) 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. \( \frac{1}{2} + \frac{1}{5} \)

7. \( \frac{1}{2} + \frac{1}{4} + \frac{1}{1} \)

8. \( \frac{1}{1} + \frac{1}{4} + \frac{1}{1} + \frac{1}{1} + \frac{1}{1} + \frac{1}{2} \)

9. \( 2 + \frac{1}{1} + \frac{1}{1} + \frac{1}{4} \)

10. \( 2 + \frac{1}{1} + \frac{1}{1} + \frac{1}{1} + \frac{1}{4} \)

11. \( \frac{1}{1} + \frac{1}{1} + \frac{1}{2} + \frac{1}{3} \)