Math 431 Complex Analysis Spring 2021 HW 12

(1) Chapter 12 Q 20, 23

(2) Let f be an element of the Möbius group. We saw earlier that f is conjugate to either $t_1 \colon z \mapsto z + 1$ or $m_a \colon z \mapsto az$.

   (a) If f fixes a single point then f is called *parabolic*. Draw the fixed circles of parabolic transformations fixing (i) ∞ and (ii) 0.
   (b) If f is conjugate to m_a where $|a| = 1$ then f is called *elliptic*. Draw the fixed circles circles of elliptic transformations fixing (i) 0 and ∞; (ii) 1 and -1.
   (c) If f is conjugate to m_a where $a \in \mathbb{R}^+$ then f is called *hyperbolic*. Draw the fixed circles circles of hyperbolic transformations fixing (i) 0 and ∞; (ii) 1 and -1.