March 2023 Problem of the Month

We define the function $f(x)$ below.

$$f(x) = \frac{3x - 1}{3x + 3}$$

Let $f^{(n)}(x)$ be the above function iterated n times.
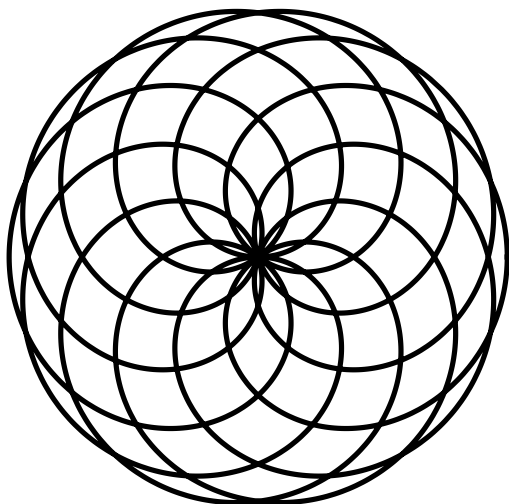
For example, $f^{(3)}(x) = f\left(f(f(x))\right)$.

a) Find $f^{(10)}(4)$.

b) Find $f^{(314159)}(2)$.

Please fully simplify all answers.

Please email solutions to Dr London at slondon@luc.edu in PDF form by 11:59 pm on March 31.

Preparing people to lead extraordinary lives