

MATH 403, HOMEWORK 10

Due: Monday, April 24 in class.

Problem 1: Define the rational function

$$f(z) = \frac{3z^2 + z - 1}{z^3 - 3z + 2}.$$

- (a) Write $f(z)$ as a sum of its principal parts.
- (b) Find the power series of $f(z)$ centered at 0 and determine its radius of convergence.
- (c) Find the Laurent series of $f(z)$ on the annulus $1 < |z| < 2$.
- (d) Find the Laurent series of $f(z)$ on the annulus $2 < |z| < \infty$.

3.1: 20

3.2: 2, 6, 10

3.3: 4 (a)-(c), 10