

## Retake 7B: Complex zeros, rational functions

FALL 2017

NAME:

1. (10 points) Define  $f(x) = 3x^4 + 5x^3 + 25x^2 + 45x - 18$ . One zero of this function is  $x = -3i$ . Find all remaining zeros, both real and complex.

2. Consider the rational function.

$$R(x) = \frac{2x^2 + 4x + 2}{x^2 + x - 6}$$

(a) Analyze the ratio of leading terms to find the end behavior. If the function has a horizontal asymptote or a slant asymptote, give its equation.

(b) Find the  $x$ -intercepts of the graph, if any.

(c) Find the equations for the vertical asymptotes, if any.

(d) Give the  $x$ -coordinates for any holes that you identify.

(e) Based on your work on the previous parts, give the  $x$ - and  $y$ -coordinates for an appropriate selection of test points.

(f) Graph the function

