

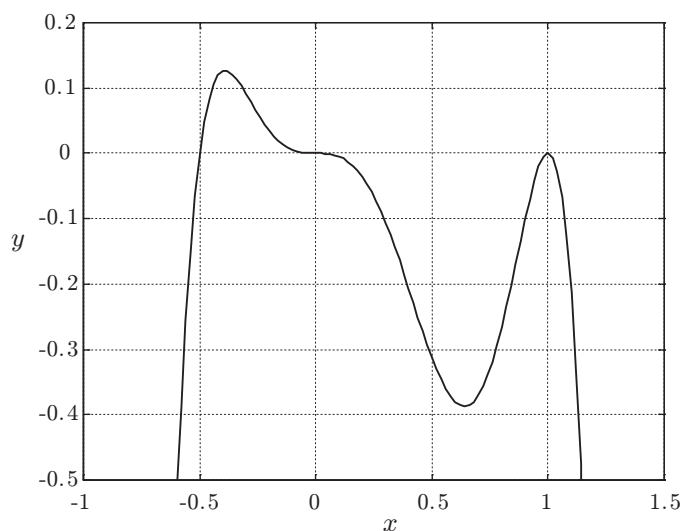
Math 121, Sample Exam 2

SHOW ALL WORK. NO CREDIT for answers only.

- Give exact answers whenever possible, otherwise give answers accurate to two decimal places. Sketch any calculator graph you use including the axes with a scale.

1. Below is the graph of a polynomial function $f(x)$. Please answer the following:

- Is the degree of $f(x)$ odd or even?
- Is the leading coefficient positive or negative?
- List the roots of $f(x)$. For each root, determine whether the multiplicity of the root is even or odd.
- What is the minimum degree of $f(x)$?



- Given that $2 - i$ is a root of $f(x) = 3x^3 - 19x^2 + 43x - 35$, find all remaining roots (real and complex).
- Consider the rational function $f(x) = \frac{1 - 3x}{5x + 4}$.
 - Find the root(s) of $f(x)$.
 - Find the vertical asymptote(s) of $f(x)$.
 - Find all holes of $f(x)$, if they exist.
 - Find the horizontal asymptote.
- Solve the inequality: $1 + x < 2x \leq 3x - 1$.

5. Simplify the following expressions:

(a) $\frac{2 + 4i}{1 - i}$ (write in the form $a + bi$)

(b) $(a^2b^{1/3})^4\sqrt[3]{ab}$ (write in the form a^xb^y)

(c) $\ln \sqrt{ex} - \ln \sqrt{\frac{e}{x}}$

6. Solve the equation: $\log(x + 1) = \log x + 2 \log 3$.

7. Suppose you invest \$1000 in a savings account. At what interest rate should the money be invested so that there is \$1100 in the account after 2 years, assuming the interest is compounded monthly? Write the interest rate as a percentage and write to two decimal places.