

Math 112
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Fall 2005
Assignment #8
Due Tuesday Nov. 22

From the Textbook:

- Section 4.7: 4-35 all, 41-50 all, 55-66 all, 71, 72.
- Section 4.8: 11-22 all, 23-26 all, 30-35 all, 49-52 all, 55, 56

Additional Exercises: (Be sure to justify all your answers)

1. Divide $f(x) = x^4 - 3x^3 + 5x^2 - 9x + 6$ by $x^2 + 3$. Use your answer to find all the roots of $f(x)$.
2. Let $f(x) = x^6 - 6x^5 + 7x^4 + 28x^3 - 189x^2 + 34x - 195$. Given $f(i) = 0$ and $f(2 - 3i) = 0$
 - (a) Write $f(x)$ as a product of linear factors (there should be 6 of them)
[Hint: you'll need to do long division twice.]
 - (b) Use your answer for part (a) to list all the roots of $f(x)$.
3. TRUE or FALSE
 - (a) If $f(x)$ is a polynomial with real coefficients and $f(2i + 3) = 0$, then we know $f(3 - 2i) = 0$.
 - (b) If $f(x)$ is a polynomial with real coefficients and $f(3 - 2i) = 0$, then we know $f(2i - 3) = 0$.
 - (c) Every non-constant polynomial with real coefficients has at least one real root.
 - (d) Every non-constant polynomial with real coefficients has at least one complex root.
 - (e) Every non-constant polynomial with real coefficients of odd degree has at least one real root.