

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECTION 5.1

Math 1090 Worksheet

FALL 2009

For practise only. Not to be submitted.

- Use long division to find the quotient $Q(x)$ and the remainder $R(x)$ when the polynomial $P(x) = 3x^4 - 4x^3 + 2x^2 + 10x - 2$ is divided by
 - $D(x) = x^2 - 2x + 3$
 - $D(x) = x + 1$
- Use synthetic division to find the quotient $Q(x)$ and the remainder $R(x)$ when
 - $2x^3 + 3x^2 - x + 5$ is divided by $x + 3$
 - $2x^4 - 11x^2 + 8x + 3$ is divided by $x - 2$
- Find all roots (zeros) of each of the following polynomials.
 - $P(x) = x^4 + 5x^3 - 3x^2 - 17x - 10$
 - $P(x) = 6x^3 - 11x^2 - 4x + 4$
 - $P(x) = 2x^4 - 5x^3 - 4x^2 + 23x - 10$
 - $P(x) = 2x^5 - 7x^4 + 18x^2 - 8x - 8$
 - $P(x) = 9x^4 - 6x^3 + 19x^2 - 12x + 2$
 - $P(x) = x^4 - 2x^3 - 17x^2 + 30x + 8$
- Factor each of the following polynomials completely into linear factors.
 - $P(x) = 16x^4 - 64x^3 + 63x^2 + 4x - 4$
 - $P(x) = 2x^4 + 5x^3 - 11x^2 - 20x + 12$
 - $P(x) = 3x^4 + 5x^3 + 10x^2 + 20x - 8$
 - $P(x) = 4x^5 - 11x^3 - x^2 + 6x + 2$
- Find all solutions (real and imaginary) of each of the following equations.
 - $2x^4 + 3x^3 - 3x^2 - 7x - 3 = 0$
 - $8x^5 + 12x^4 + 14x^3 + 13x^2 + 6x + 1 = 0$
 - $x^3 + x - 10 = 0$
- Find a polynomial of lowest possible degree that has 2 as a root of multiplicity 3, and -1 as a root of multiplicity 1.
 - Find a polynomial with real coefficients that has 3 and $-1 + i$ as roots.
 - Find a polynomial with real coefficients that has -4 and $3 - 2\sqrt{2}$ as roots, and for which $P(0) = -8$.