

Unit 2: Polynomial Functions

ADVANCED

Name: _____ Date: _____

Show all work. Write each answer as a single exact value using plain-text notation (e.g., $3/4$, 2^3 , $\text{sqrt}(16)$, $(3, -4)$).

1. The polynomial $g(x) = x^3 - 4x^2 + x + 6$ has a factor of $(x - 3)$. Find the sum of its other two zeros.

Answer: _____

2. A cubic polynomial with leading coefficient 1 has zeros 2, -3, and 5. Find its constant term (the value of the polynomial at $x = 0$).

Answer: _____

3. For the polynomial $P(x) = 3x^4 - 2x^3 + x^2 - 7x + 10$, find the sum of all four roots (real and complex), counting multiplicity.

Answer: _____

4. The equation $2x^3 - 3x^2 - 11x + 6 = 0$ has $x = 3$ as a root. Find the product of the other two roots.

Answer: _____

5. Fully factor $8x^3 - 27$ over the reals and find the sum of the constants in the linear and quadratic real factors, i.e., for $(ax - b)(cx^2 + dx + e)$, compute $b + e$.

Answer: _____