Algebra II | Activity 1020 | Name:
Dr. Paul L. Bailey | Thursday, October 20, 2022

Write all polynomials in standard form (like terms combined, decreasing power order).

Problem 1. (Adding Polynomials)
Let $f(x) = x^4 - 3x^3 + 5x^2 - 2x + 4$.
Let $g(x) = 4x^3 + 9x^2 - 7$.

(a) Identify $\deg(f)$, $\mathrm{LC}(f)$, and $\mathrm{CC}(f)$.

(b) Identify $\deg(g)$, $\mathrm{LC}(g)$, and $\mathrm{CC}(g)$.

(c) Compute $h(x) = f(x) + g(x)$.

(d) Identify $\deg(h)$, $\mathrm{LC}(h)$, and $\mathrm{CC}(h)$.

(g) Compute $p(x) = 3f(x) + 2xg(x)$.

(h) Identify $\deg(p)$, $\mathrm{LC}(p)$, and $\mathrm{CC}(p)$.

Problem 2. (Multiplying Polynomials)
Multiply these polynomials.
Write the result in standard form.

(a) $(x - 5)(x + 7)$

(b) $(x^2 + 2)(x - 4)$

(c) $(x - 3)^3$

(d) $(x^2 + x + 1)^2$

(e) $(x^2 + 2x + 3)(x^2 + 9)$

(f) $(x + 1)(x + 2)(x + 3)(x + 5)$

Problem 3. (Evaluating Polynomials)
Let $g(x) = x^3 - 3x^2 + 2x - 7$. Find $g(5)$.

Problem 4. (Dividing Polynomials)
Let $g(x) = x^3 - 3x^2 + 2x - 7$ and $f(x) = x - 5$. Find the quotient and remainder when g is divided by f.

Problem 5. (Evaluating Polynomials)
Let $g(x) = x^5 - 3x^3 + 2x + 4$. Find $g(2)$.

Problem 6. (Dividing Polynomials)
Let $g(x) = x^5 - 3x^3 + 2x + 4$ and $f(x) = x - 2$. Find the quotient and remainder when g is divided by f.

Problem 7. (Dividing Polynomials)
Let $g(x) = x^4 + x^3 - 3x^2 + 2x - 7$ and $f(x) = x^2 - 5x + 2$. Find the quotient and remainder when g is divided by f.