Date: **Section: 4.2 Notes**

Objective: Adding and Subtracting Polynomials

Constant: A monomial that contains no variables, like 23 or −1.

Coefficient: The numerical part of a monomial (the number being multiplied by the variables.)

Variable: A letter that represents an unknown number

Expression: A term or terms (there is no equal sign)

Terms: The monomials that make up a polynomial. Terms are separated by + or − signs.

Monomial: An expression that is a number, a variable, or numbers and variables multiplied together. Monomials only have variables with whole number exponents and never have variables in the denominator of a fraction or variables under roots.

Monomials: $5b$, $\dfrac{xyz}{8}$, $-w$, 23, x^2, $\dfrac{1}{3}x^3y^4$ **Not Monomials:** $\dfrac{1}{x^4}$, $\sqrt[3]{x}$, a^{-1}, $z^{\frac{1}{5}}$

Binomial: A polynomial with two unlike terms.

Trinomial: A polynomial with three unlike terms.

Polynomial: A monomial or several monomials joined by + or – signs.

Like Terms: Terms whose variables and exponents are exactly the same

Standard form: Terms are in descending order (highest power first to lowest power and at the end is the constant

How to find the degree of a polynomial: Find the term with the highest exponent….that's the degree of the polynomial

Reasons for not a polynomial: Negative exponent, variable in the denominator, exponent is a fraction, variable under a radical sign.

Examples: Decide whether each expression is a polynomial. If it is, state the degree of the polynomial. If it is not, explain why not.

a) $5x^4 + 2x^3 + 6x$

b) $-\dfrac{4}{3}a - a^5$

c) $\dfrac{12}{m+2}$

d) $6c^{-2} + c - 1$

e) $6z^{\frac{1}{2}} + 5z^2 - 2$

f) 7

g) $-8n - 3$

h) $3\sqrt{x} + 2$

Adding and Subtracting Polynomials

To add or subtract polynomials, combine like terms. Add or subtract the coefficients. The variables and exponents do not change. ***Remember to subtract everything inside the parentheses after a minus sign.*** Subtract means "add the opposite," so change the minus sign to a plus sign and then change the signs of all the terms inside the parentheses.

Examples: Simplify each expression.

a) $\left(5n^2 - 2\right) + \left(7 - 3n^2\right)$

b) $\left(2r^2 + 5r\right) + \left(r^2 - 4r\right)$

c) $\left(4x^2 - 3x + 1\right) + \left(-2x^2 + 5x - 6\right)$

d) $\left(7z^2 + 12z - 5\right) + \left(6z - 4z^2 - 3\right)$

e) $\left(2w^2 + 3w\right) - \left(4w^2 + w\right)$

f) $\left(u^3 - 4u^2 + u\right) - \left(2u^2 - 5u^3\right)$

g) $\left(-6x^2 - 3x + 2\right) - \left(-4x^2 - x + 3\right)$

h) $\left(4y^2 + 12y - 7\right) - \left(20y + 5y^2 - 8\right)$

i) $\left(6m^2 + 5m\right) - \left(4m^2 - 2m\right) + \left(3m^2 - 7m\right)$

j) $\left(-2k + 5\right) + \left(k^2 - 3k\right) - \left(-4k^2 + 8\right)$