

Operations and Composition with Polynomials

– **polynomial** → a _____ or the _____

- standard form of a polynomial – a _____ form of a polynomial where the _____
_____ are written so _____

- degree of a polynomial – the _____ or the _____

Below is a chart that classifies each type of polynomial:

Degree	Name Based Degree

Number of Terms	Name Based # of Terms

Example 1: Complete the chart below.

Given Problem	Put in Standard Form	Classification
a.) $3a^2 + 5a - 4 + 5a^2 - 8$		
b.) $4x - (3 - 2x) + 3x$		
c.) $5w^3 - 4 + 2w^2 + 3w^6$		
d.) $6y + 2y(4xy - 3)$		

- **evaluating (a polynomial)** → process of \dots into a function

Example 2: Given $f(x) = 4x - 2$, $g(x) = x^2 - 2x + 4$, $h(x) = \begin{cases} 2x - 5 & \text{if } x < -1 \\ 3 - x & \text{if } x \geq -1 \end{cases}$, evaluate completely.

a.) $f(4) + 3g(-2)$	b.) $2h(-2) - 3h(4)$	c.) $3g(x-2) + f(3x)$	d.) $f(x+4) - g(x+1)$
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Operations with Functions

Arithmetic Operations With Functions Chart		
Operation	Definition	Examples if $f(x) = x + 2$ and $g(x) = 3x$
Sum	$(f + g)(x) = \underline{\hspace{2cm}}$	
Difference	$(f - g)(x) = \underline{\hspace{2cm}}$	
Product	$(f \cdot g)(x) = \underline{\hspace{2cm}}$	
Quotient	$\left(\frac{f}{g}\right)(x) = \underline{\hspace{2cm}}$	
Equation	$(f = g)(x) \rightarrow \underline{\hspace{2cm}}$	
Composition	$(f \circ g)(x) = \underline{\hspace{2cm}}$	

Example 3: Perform the indicated operation(s) with the following functions:

$$f(x) = 2x - 3$$

$$g(x) = 6 - \frac{1}{2}x$$

$$h(x) = x^2 - 2x - 3$$

$$k(x) = 2x^2 + 5x - 12$$

a.) $(f - g)(x)$	b.) $(f \cdot h)(x)$	c.) $\left(\frac{f}{k}\right)(x)$	d.) $(f = h)(x)$
d.) $(f \circ g)(16)$	e.) $(k \circ g \circ f)(-1)$	f.) $(f \circ f)(x)$	g.) $(h \circ f)(x)$