Alg 4 Summer Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_

 WS Assessment

 Target 3:

Operations on polynomial

**I can:**

* Perform operations on polynomial functions:
	+ Addition / Subtraction
	+ Multiplication
	+ Long division
	+ Synthetic division

 **Unit 6: Polynomials and Their graph**

* [**HSA.APR.A.1**](http://www.corestandards.org/Math/Content/HSA/APR/A/1/): Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
* [**HSA.APR.B.3**](http://www.corestandards.org/Math/Content/HSA/APR/B/3/): Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
* [**HSF.IF.C.7.C**](http://www.corestandards.org/Math/Content/HSF/IF/C/7/c/): Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

Add / Subtract (Combine like terms)

|  |  |
| --- | --- |
| (14x + 5) + (10x + 5) = | (6x + 19) – (14x + 5) = |
| (19x2 + 12x + 12) + (7x2 + 10x + 13) = | (19x2 + 9x + 16) – (5x2 + 12x + 7) = |
| (-15x2 - 5x + 9) + (-6x2 - 19x - 16) + (-15x2 - 14x - 13) + (9x2 - 14x + 20) = | (-9x2 - 4x - 4) – (-9x2 - 11x + 12) = |
| (4x2 - 6x + 7) + (-19x2 - 15x - 18) = | (20x6 - 13x5) – (-7x6 + 7x5 - 20x3 - 4x2) = |
| (20x7 - 10x6 - 9x5 - 14x4 + 18x) + (-6x6 - 12x5 - 9x4 - 9x) = | (4x2 + 15x - 18) – (9x2 - 5x + 19) – (-5x2 + 18x - 20) – (-4x2 - 7x + 15) = |

**Multiply**

(3x + 2)(2x - 3) (-2x2 - 4x + 11)(5x - 12)

(6x7 - 8x2 + 7)(-4x - 3)(-6x2 - 7x – 11)

Dividing Polynomial: Long division

$\frac{2x^{2}+10x+12}{x+3}$ $\frac{5x^{2}-17x-12}{x-4}$

$\frac{4x^{3}-7x^{2}-11x+5}{4x+5}$ $\frac{6x^{3}+10x^{2}+x+8}{2x+1}$

$\frac{x^{4}+3x^{2}+1}{x^{2}-2x+3}$ $\frac{2x^{3}-4x^{2}-15x+5}{(x-1)^{2}}$

Synthetic division

$\frac{2x^{2}+10x+12}{x+3}$ $\frac{5x^{2}-17x-12}{x-4}$

$\frac{4x^{3}-7x^{2}-11x+5}{4x+5}$ $\frac{6x^{3}+10x^{2}+x+8}{2x+1}$

$\frac{x^{4}+3x^{2}+1}{3-x}$ $\frac{2x^{3}-4x^{2}-15x+5}{1-x}$

Remainder Theorem: If the polynomial *f*(*x*) is divided by *x* - *c*, then the reminder is *f*(*c*).

Given f(x) = 3x3 + x2 + x – 5, find f(-2) by 5 different ways

R. Theorem Plug in Function Table Manual

Given f(x) = 3x3 + x2 + x – 4, find f(-2.2) by 5 different ways (stamp)

R. Theorem Plug in Function Table Manual

**Assessment Target 3**

**I can…** perform basic operations on polynomial

Add / Subtract

(-x4 + 7x3 + 18x – 13) + (4x4 – 2x3 – 6x2 + 5x – 20)

(-5x4 – 2x3 + 6x2 – 8) – (-6x3 + 4x2 + 5x + 2)

(-5x4 +3x3 + 12x – 10) + (x4 – 2x3 – 4x2 + 2x – 10)

(-3x4 – 10x3 + 19x2 – 12) – (-16x3 + 14x2 + 5x + 4)

Multiply

(2x – 1)(3x + 5)(4x + 3) (x – 1)(3x + 2)(4x – 1)

Synthetic division

(3x3 + 7x + 5)$÷$(x – 4) (4x3 + 16x2 – x – 43) $÷$ (2x + 5)

Long division

(4x3 + 16x2 – x – 43) $÷$ (2x + 5)