* Adding polynomials – combine like terms

Ex. $\left(3x^{3}+x^{2}-5\right)+(4x^{3}+7x+8)$ = $7x^{3}+x^{2}+7x+3$

* Subtracting polynomials – distribute negative and combine like terms

Ex. $\left(4x^{3}+2x^{2}-5x+2\right)-(2x^{3}+3x+8)$ = $4x^{3}+2x^{2}-5x+2-2x^{3}-3x-8$ = $2x^{3}+2x^{2}-8x-8$

* Multiplying Polynomials

Distribute all terms to all terms. Multiply coefficients and add exponents.

Ex. $2x\left(x-3\right)$ = $2x^{2}-6x$

Ex. $\left(x-3\right)\left(x+6\right)=x^{2}+6x-3x-18$ = $x^{2}+3x-18$

Ex. $\left(x-1\right)\left(2x^{2}+2x-7\right)=2x^{3}+2x^{2}-7x-2x^{2}-2x+7$ = $2x^{3}-9x+7$

* Dividing Polynomials

You will only have to do synthetic division! We know how to do synthetic division.

* Combination with a value

Plug the number in to each function and then perform the given operation (add, subtract, multiply or divide)

* Composition

$f\left(g\left(x\right)\right)$ means to plug g(x) into f(x)

If there’s a number plug it in to the inside function first and then take the new number and plug it into the outside function.

* Inverse

1. switch x and y

2. solve for y (get the y by itself)

Add or subtract.

1. $\left(5x+2\right)+(x-3)$ 2. $\left(x^{2}-5\right)-(x+4)$

3.  4. 

5. $\left(x^{3}+2x^{2}-7x+4\right)+(4x^{3}-5x^{2}-2x-8)$ 6. $\left(x^{3}-3x^{2}+4\right)-(2x^{2}-8x+6)$

Multiply.

7.$(x+2)(x-5)$ 8. $2x(8x-5)$

9. $(x^{2}-3)(2x+1)$ 10. $(x+1)(2x^{2}-5x-8)$

Divide using synthetic division. (remember 0’s when you have missing factors)

11. $ (12x^{3}-11x^{2}+7x+14)÷(x+3)$ 12.$ (6x^{5}-33x^{4}+150x^{2}-96)÷(x-4)$

13.$ (7x^{3}-4x^{2}+7x+18)÷(x+2)$ 14.$ (2x^{4}-7x^{3}-15x-4)÷(x-4)$

Given f(x) = 3x – 2, g(x) = x2 – 4 and h(x) = x + 5, find the following:

15. (f+g)(-2) =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 16. (f – g)(6) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

17. (f∙g)(1) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 18. (g/h)(0) =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

19. g(f(-1)) =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 20. f(g(3)) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

For 21-22 use $f\left(x\right)=x-5$ and $g\left(x\right)=x^{2}+2$

21. Find $\left(f∘g\right)\left(x\right)$ 22. Find $\left(g∘f\right)\left(x\right)$

Find the inverse of the following functions.

23. $f\left(x\right)= 2x-5$ 24. $f\left(x\right)= \frac{1}{2}x+3$

25. $y=\sqrt{x+4}$ 26. $y= \sqrt{x}-3$