Adv. Algebra | Combining Functions | 1A.3 – Polynomial Functions

Name: Key Date: _____

Functions and Relations

- Relation: Any set of input that has an output.
- Function: A relation such that every single input has exactly one output.
  - **Never repeat the x-values **

Function Notation:

- Function notation is a way to name a function. It is pronounced "f of x".
- f(x) is a fancy way of writing "y" in an equation.
  - Example: y = 2x + 4 is the same as $f(x) = 2x + 4$

Combining Functions

Examples:

1. Given the functions $f(x) = 6x^2 - 3x + 5$ and $g(x) = 4x^2 + 5x - 8$
   Find $g(x) - f(x)$

   $4x^2 + 5x - 8 - (6x^2 - 3x + 5)$

   $-2x^2 + 8x - 13$

2. Given the functions $f(x) = 6x^2 - x + 3$ and $g(x) = x^2 + 3x$
   Find $2f(x) + 3g(x)$

   $2(6x^2 - x + 3) + 3(x^2 + 3x)$

   $12x^2 - 2x + 6 + 3x^2 + 9x = 15x^2 + 7x + 6$

3. Given the functions $f(x) = 2x - 4$ and $g(x) = x^2 - 3$
   Find $2g(x) \cdot f(x)$

   $2(x^2 - 3) \cdot (2x - 4)$

   $(2x^2 - 6)(2x - 4)$

   $4x^3 - 8x^2 - 12x + 24$

Given the functions $f(x) = 4x^2 - 2x + 5$ and $g(x) = x^2 + 7x - 8$

4. Find $f(x) + g(x)$

   $5x^2 + 5x - 3$

5. Find $4g(x) - f(x)$

   $4(x^2 + 7x - 8) - (4x^2 - 2x + 5)$

   $4x^2 + 28x - 32 - 4x^2 + 2x - 5$

   $30x - 37$

Given $f(x)=5x^2-9x+2$ $g(x)=x^2+3x-8$ $h(x)=-2x^2+1$ and $k(x)=4x-3$

6. Find $4f(x)+3g(x)$

$4(5x^2-9x+2)+3(x^2+3x-8)$

$20x^2-36x+8+3x^2+9x-24$

$23x^2-27x-16$

7. Find $h(x)-f(x)$

$-2x^2+1-(5x^2-9x+2)$

$-7x^2+9x-1$

8. Find $h(x)\bullet k(x)$

$(-2x^2+1)(4x-3)$

$-8x^3+6x^2+4x-3$

9. Find $h(3)+g(-4)$

$-2(3)^2+1+(-4)^2+3(-4)-8$

$-18+1+16-12-8$

-21

10. Find $5f(x)+7g(x)$

$5(5x^2-9x+2)+7(x^2+3x-8)$

$25x^2-45x+10+7x^2+21x-56$

$32x^2-24x-46$

11. Find $f(x)\bullet 2k(x)$

$(5x^2-9x+2)\cdot 2(4x-3)$

$(5x^2-9x+2)(8x-6)$

$40x^3-30x^2-72x^2+54x+16x-12$

$40x^3-102x^2+70x-12$

12. Find $h(2)-f(-1)$

$-2(2)^2+1-[5(-1)^2-9(-1)+2]$

$-8+1-[5+9+2]$

$-7-16=-25$

13. Find $3f(x)\bullet h(x)$

$3(5x^2-9x+2)\cdot(-2x^2+1)$

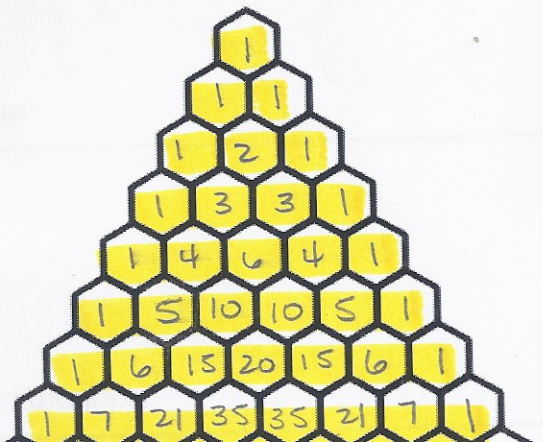
$(15x^2-27x+6)(-2x^2+1)$

$-30x^4+15x^2+54x^3-27x-12x^2+6$

$-30x^4+54x^3+3x^2-27x+6$

Don't Forget:

14. Fill in Pascal's Triangle



15. $(x+2)^6$

$\underline{1}x^6(2)^0+\underline{6}x^5(2)^1+\underline{15}x^4(2)^2+$

$+\underline{20}x^3(2)^3+\underline{15}x^2(2)^4+\underline{6}x(2)^5$

$+1x^0(2)^6=$

$x^6+12x^5+60x^4+120x^3+120x^2$

$+192x+64$