Name: Key Hour: _____ Date: _____

Directions: Compare the methods for operations on functions. Show your work.

Given $h(x) = x^2 - 4x + 2$ and $k(x) = 3x + 7$, find each function.

$(h + k)(x) = h(x) + k(x)$

Vertical Method	Horizontal Method
$x^2 - 4x + 2$ $3x + 7$ $x^2 - x + 9$	$(x^2 - 4x + 2) + (3x + 7)$ $x^2 - x + 9$

$(h - k)(x) = h(x) - k(x)$

Vertical Method	Horizontal Method
$x^2 - 4x + 2$ $-3x - 7$ $x^2 - 7x - 5$	$(x^2 - 4x + 2) - (3x + 7)$ $x^2 - 4x + 2 - 3x - 7$ $x^2 - 7x - 5$

$(h \cdot k)(x)$

Box Method

	x^2	$-4x$	$+2$
$3x$	$3x^3$	$-12x^2$	$+6x$
$+7$	$+7x^2$	$-28x$	$+14$

$3x^3 - 12x^2 + 6x + 7x^2 - 28x + 14$

$3x^3 - 5x^2 - 22x + 14$

Distributive Method

$(x^2 - 4x + 2)(3x + 7)$

$3x^3 + 7x^2 - 12x^2 - 28x + 6x + 14$

$3x^3 - 5x^2 - 22x + 14$

Which method do you prefer for addition, subtraction, and multiplication of functions? Why? Write your response below.

So which method do you prefer?

Name: Key Hour: _____ Date: _____

Directions: Compare two different approaches for simplifying expressions using properties of exponents. Show your work.

$$\frac{27x^{-4}y^{5}}{9x^{2}y^{-6}}$$

Approach #1

$\frac{27y^5y^6}{9x^2x^4}$ (5+6) (2+4)

$\frac{27}{9}=\frac{3}{1}$

$\frac{3y^{11}}{x^6}$

"Flip approach"

Approach #2

$3x^{-4-2}y^{5-(-6)}$

$3x^{-6}y^{11}$

$\frac{3y^{11}}{x^6}$

"Subtract approach"

$$\left(\frac{a^{-5}c^{0}}{a^{4}c^{3}}\right)^{4}$$ Distribute 4

Approach #1

$\frac{a^{-20}c^{0}}{a^{16}c^{12}}$

$\frac{c^0}{a^{16}a^{20}c^{12}}$ (16+20)

$\frac{1}{a^{36}c^{12}}$

"Flip approach"

Approach #2

$\frac{a^{-20}c^{0}}{a^{16}c^{12}}$

$a^{-20-16}c^{0-12}$

$\frac{a^{-36}c^{-12}}{1}$

$\frac{1}{a^{36}c^{12}}$

"Subtract approach"

$$\frac{(4^{3}x^{5}y)^{-2}}{4xy}$$

Approach #1

$\frac{4^{-6}x^{-10}y^{-10}}{4xy}$

$\frac{1}{4^6\cdot4^1\cdot x^{10}\cdot x^1\cdot y^{10}\cdot y^1}$ (6+1) (10+1) (10+1)

$\frac{1}{4^7x^{11}y^{11}}$

$\frac{1}{16{,}384x^{11}y^{11}}$

Approach #2

$\frac{4^{-6}x^{-10}y^{-10}}{4^1x^1y^1}$

$4^{-6-1}x^{-10-1}y^{-10-1}$

$\frac{4^{-7}x^{-11}y^{-11}}{1}$

$\frac{1}{4^7x^{11}y^{11}}$

$\frac{1}{16{,}384x^{11}y^{11}}$

Which approach do you prefer to simplifying expressions? Why? Write your response below.

So which approach do you prefer?