Name: Key Date: ______________

BASIC EXPONENT PROPERTIES
COMMON CORE ALGEBRA II HOMEWORK

FLUENCY

1. The steps in finding the product of $(3x^2y^5)$ and $(7x^5y^2)$ are shown below. Fill in either the associative property or the commutative property to justify each step.

$(3x^2y^4)(7x^5y^2)$

$=(3x^2)(y^4\cdot 7)(x^5y^2)$ Associative

$=(3x^2)(7y^4)(x^5y^2)$ Commutative

$=3(x^2\cdot 7)(y^4x^5y^2)$ Associative

$=3(7x^2)(x^5y^4y^2)$ Commutative

$=(3\cdot 7)(x^2x^5)(y^4y^2)$ Associative

$=21x^7y^6$

2. Find each of the following products of monomials.

(a) $(3x^2)(10x^4)$ $30x^6$

(b) $(-2x^5)(-9x)$ $18x^6$

(c) $(4x^2y)(8x^5y^3)$ $32x^7y^4$

(d) $(5x^4)^2$ $25x^8$

(e) $(-4t^2)(-15t^5)$ $60t^7$

(f) $(7x)(5xy^4)$ $35x^2y^4$

(g) $\left(\frac{2}{3}x^4\right)(12x)$ $8x^5$

(h) $(2x^2)(5x)(-6x^4)$ $-60x^7$

3. Fill in the missing portion of each product to make the equation an identity.

(a) $18x^6=3x^2(\underline{6x^4})$

(b) $40x^2y^7=8xy^2(\underline{5xy^5})$

(c) $90x^4y=15xy(\underline{6x^3})$

(d) $24x^6=-3x^2(\underline{-8x^4})$

(e) $-48x^4y^{10}=-16x^2y^2(\underline{3x^2y^8})$

(f) $49x^8y^6=7x^4y^3(\underline{7x^4y^3})$

4. Use the distributive property to write each of the following products as polynomials.

(a) $4x(5x+2)$

$20x^2+8x$

(b) $-5x(10-x)$

$-50x+5x^2$

(c) $6x(x^2-4x+8)$

$6x^3-24x^2+48x$

(d) $-10x^2(2x^2+x-8)$

$-20x^4-10x^3+80x^2$

(e) $7xy^3(2x^2y-5y^5)$

$14x^3y^4-35xy^8$

(f) $8x^2y^2(x^3-2x^2y+5xy^2-y^3)$

$8x^5y^2-16x^4y^3+40x^3y^4-8x^2y^5$

(g) $-7x^3(4x^2+2x-1)$

$-28x^5-14x^4+7x^3$

(h) $-16t(2t^2-2t+3)$

$-32t^3+32t^2-48t$

(i) $12xy(x^2-2xy+y^2)$

$12x^3y-24x^2y^2+12xy^3$

5. Fill in the missing part of each product in order to make the equation into an identity.

(a) $10x^5-35x^3=5x^3(\underline{2x^2-7})$

(b) $-8x^3y+2x^2y^2-10xy^3=-2xy(\underline{4x^2-xy+5y^2})$

(c) $-18t^2+45t^5=-9t^2(\underline{2-5t^3})$

(d) $45x^4-30x^3+15x^2=15x^2(\underline{3x^2-2x+1})$

(e) $x(x+5)+6(x+5)=(x+5)(\underline{x+6})$

(f) $x^2(x-3)-(x-3)=(x-3)(\underline{x^2-1})$

Reasoning

Another very important exponent property occurs when we have a monomial with an exponent that is then raised to yet another power. See if you can come up with a general pattern.

6. Write each of the following out as extended products and then simplify. The first is done as an example.

(a) $(x^2)^3=x^2\cdot x^2\cdot x^2=x^6$

(b) $(x^3)^2=x^3\cdot x^3=x^6$

(c) $(x^5)^4=x^5\cdot x^5\cdot x^5\cdot x^5=x^{20}$

(d) $(x^4)^3=x^4\cdot x^4\cdot x^4=x^{12}$

7. So, what is the pattern? For positive integers a and b: $(x^a)^b=\underline{x^{ab}}$