Name: _____Key_____   Date: _____

VARIABLES, TERMS, AND EXPRESSIONS
COMMON CORE ALGEBRA II HOMEWORK

FLUENCY

1. For each of the following expressions, state the number of terms.

(a) $3x^2 - 1$

$\boxed{2}$

(b) $8x + 7x^2 - 2 + x^3$

$\boxed{4}$

(c) $7xy - 2x^2y^2 + \frac{1}{2}xy^4$

$\boxed{3}$

2. Simplify each of the following expressions by combining like terms. Be careful to only combine terms that have the same variables and powers.

(a) $\underline{2x^2} + \underline{8x} - \underline{1} + \underline{5x^2} - \underline{2x} - \underline{8}$

$(2x^2 + 5x^2) + (8x - 2x) + (-1 - 8)$

$\Rightarrow \boxed{7x^2 + 6x - 9}$

(b) $\underline{-5x^2} - \underline{2x} + \underline{10} - \underline{x^2} + \underline{7x} + \underline{5}$

$(-5x^2 - x^2) + (-2x + 7x) + (10 + 5)$

$\Rightarrow \boxed{-6x^2 + 5x + 15}$

(c) $\underline{4x^2y} - \underline{2xy^2} + \underline{9xy^2} - \underline{x^2y}$

$(4x^2y - x^2y) + (-2xy^2 + 9xy^2)$

$\Rightarrow \boxed{3x^2y + 7xy^2}$

(d) $\underline{7x^2} - \underline{2x^2y} + \underline{4xy^2} - \underline{y^3} + \underline{2x^2} + \underline{9x^2y} + \underline{4y^3}$

$(7x^2 + 2x^2) + (-2x^2y + 9x^2y) + (4xy^2)$

$+ (-y^3 + 4y^3)$

$\Rightarrow \boxed{9x^2 + 7x^2y + 4xy^2 + 3y^3}$

3. Given the algebraic expression $\dfrac{12x + 12}{x^2 - 1}$ do the following:

(a) Evaluate the expression for when $x = 7$.

$\dfrac{12(7) + 12}{(7)^2 - 1} \Rightarrow \dfrac{84 + 12}{49 - 1} \Rightarrow \dfrac{96}{48}$

$\Rightarrow \boxed{2}$

(b) Evaluate the expression for when $x = 4$.

$\dfrac{12(4) + 12}{(4)^2 - 1} \Rightarrow \dfrac{48 + 12}{16 - 1} \Rightarrow \dfrac{60}{15}$

$\Rightarrow \boxed{4}$

(c) Nina believes that this expression is equivalent to dividing (12 by one less than x.) Do your results from (a) and (b) support this assertion? Explain.

a.) $\dfrac{12}{7-1} = \dfrac{12}{6} = \boxed{2}$ ✓

b.) $\dfrac{12}{4-1} = \dfrac{12}{3} = \boxed{4}$ ✓

$\dfrac{12}{x-1}$ ✓ Lets check!

Yes, both expressions are equivalent to the answers in a & b.

4. Classify each of the following as either a monomial (single term), a binomial (two terms) or a trinomial (three terms).

(a) $4x^2$

monomial

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

trinomial

(c) $16-x^2$

binomial

(d) x^2y^2+25

binomial

(e) $\dfrac{5x^5}{3}$

monomial

(f) $16+10t-4t^2$

trinomial

5. Use the distributive property first and then combine each of the following linear expressions into a single, equivalent binomial expression.

(a) $5(2x+3)+2(4x-1)$

$10x+15+8x-2$

$\Rightarrow \boxed{18x+13}$

(b) $2(10x+1)-3(4x-5)$

$20x+2-12x+15$

$\Rightarrow \boxed{8x+17}$

6. Which of the following is equivalent to the expression $2(x-6)+4(2x+1)+3$?

(1) $8(x-2)$

(3) $4(2x+3)$

(2) $5(2x-1)$

(4) $10(x-1)$

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

$\Rightarrow 10x-5$ common factor of 5   **2.**

$\Rightarrow 5(2x-1)$

REASONING

7. Each step in simplifying the expressions you worked with in 5 and 6 can be justified using one of the major properties of real numbers reviewed in the lesson. Justify each step below with either the commutative, associative or distributive properties when simplifying the expression $8(3x+1)+2(5x+7)$.

$8(3x+1)+2(5x+7)=24x+8+10x+14$ ___Distributive___

$=24x+10x+8+14$ ___Commutative___

$=(24x+10x)+(8+14)$ ___Associative___

$=x(24+10)+22$ ___Distributive___

$=34x+22$

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