

SUBUNIT B1 SELF-CHECK FOR INTEGRATED ALGEBRA 1 – FORM 1

Lessons 2.1 (Algebraic Expressions) & 2.3a (Problem Solving 1: Translating Words into Algebra)

NOTES:

1. The purpose of this Self-Check is to help you prepare for the Subunit Mastery Test. It is recommended that you **print out this Self-Check work it like you would the actual test.**
2. You do not need to turn your work for this activity into your instructor; however, your instructor will help you with any problems that give you trouble. Presenting your work in a neat and organized manner will make it easier for your instructor to zero in on where you have gone astray.



1. [13] Given the expression: $5x^3 - x^2y^2 + 8xy^2 - 3y^3 + 36\dots$
 - a. What are the terms in the expression?
 - b. What are the coefficients in the expression?
 - c. What is the degree of this polynomial?
2. [21] **Completely simplify** each of the expressions below. Give your answer in **descending order**. **NOTE: Partial credit will not be awarded unless work is shown.**
 - a. $-13 + 7x + 8 - 12x$
 - b. $7(6c - 8) - [-9c]$
 - c. $23w - 5(8w - 16)$
3. [20] **Completely simplify** each of the expressions below. Give your answer in **descending order**. **NOTE: Partial credit will not be awarded unless work is shown.**
 - a. $3a(6ab + 15b - 2) - b(-a^2 - 7a + 4)$
 - b. $4x([-5x] + 7y) - (x^2 - [-xy]) - 9$
4. [21] Evaluate each expression below using the given values for the variables. **NOTE: Partial credit will not be awarded unless work is shown.**
 - a. $6c - 10d - [-15]$, when $c = 5$ and $d = -1$.
 - b. $-2m^2 - 8mn + 6p^3 - 17$, when $m = -3$, $n = 6$, and $p = -4$
 - c. $-5x(y^2 - 3xy) + 2y^3$, when $x = 3$ and $y = -2$.
5. [10] Sherrie bought 5 pounds of 80% for \$3.09 per pound, 2 cans of tomatoes for 77¢ per can, and a gallon of milk for \$3.49.
 - a. Write an expression that can be used to determine how much she spent all together.
 - b. Evaluate your expression from Part a to find out how much she spent altogether?
6. [15] Translate each phrase below into an algebraic expression.
 - a. the product of 14 and j
 - b. increase y by the product of twelve and z
 - c. 55 less than $\frac{3}{10}$ of q
 - d. the sum of m and n , divided by 13
 - e. the difference of 8 and the product of y and z .

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Answer Key with Solutions to Selected Problems1. [13] Given the expression: $5x^3 - x^2y^2 + 8xy^2 - 3y^3 + 36\dots$ a. What are the terms in the expression? The terms are: $5x^3, -x^2y^2, 8xy^2, -3y^3, 36$ b. What are the coefficients in the expression? The coefficients are: $5, -1, 8, -3, 36$

c. What is the degree of this polynomial?

The *degree* of a polynomial is determined by finding the **largest sum of the exponents** of the terms. For this problem, the sums of the exponents of the terms, respectively, are: 3, 4, 3, 3, & 0. **Thus, the degree of this polynomial is 4.**2. [21] **Completely simplify** each of the expressions below. Give your answer in **descending order**. **NOTE: Partial credit will not be awarded unless work is shown.**a. $-13 + 7x + 8 - 12x$

1. Change all subtraction to adding the opposite.

$$-13 + 7x + 8 + [-12]x$$

2. Add the like terms. (*Terms with the same letter portions.*)

$$\begin{array}{r} 7x \quad [-13] \\ +[-12x] \quad + 8 \\ \hline \end{array}$$

Answer: $-5x - 5$

b. $7(6c - 8) - [-9c]$

1. Change all subtraction to adding the opposite.

$$7(6c + [-8]) + [+9c]$$

2. Eliminate the parentheses using the Distributive Property.

$$42c + [-56] + [9c]$$

3. Add the like terms. (*Terms with the exact same letter portions.*)

$$\begin{array}{r} 42c \quad [-56] \\ +[9c] \quad \quad \quad \\ \hline \end{array}$$

Answer: $51c - 56$

c. $23w - 5(8w - 16)$

1. Change all subtraction to adding the opposite.

$$23w + [-5](8w + [-16])$$

2. Eliminate the parentheses using the Distributive Property.

$$23w + [-40w] + 80$$

3. Add the like terms. (*Terms with the exact same letter portions.*)

$$\begin{array}{r} 23w \quad 80 \\ +[-40w] \quad \quad \quad \\ \hline \end{array}$$

Answer: $-17w + 80$

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3. [20] **Completely simplify** each of the expressions below. Give your answer in **descending order**. **NOTE: Partial credit will not be awarded unless work is shown.**

a. $3a(6ab + 15b - 2) - b(-a^2 - 7a + 4)$

1. Change all subtraction to adding the opposite.
 $3a(6ab + 15b + [-2]) + [-b](-a^2 + [-7a] + 4)$

2. Distribute to eliminate the parentheses.
 $18a^2b + 45ab + [-6a] + a^2b + 7ab + [-4b]$

3. Add the like terms.

$18a^2b$	$45ab$	$[-6a]$	
$+ a^2b$	$7ab$		$[-4b]$

Answer: $19a^2b + 52ab - 6a - 4b$

b. $4x([-5x] + 7y) - (x^2 - [-xy]) - 9$

1. Change all subtraction to adding the opposite.
 $4x([-5x] + 7y) + [-1](x^2 + [+xy]) + [-9]$

2. Distribute to eliminate the parentheses.
 $-20x^2 + 28xy + [-1x^2] + [-1xy] + [-9]$

3. Add the like terms.

$-20x^2$	$28xy$		
$+ [-1x^2]$	$[-1xy]$		$[-9]$

Answer: $-21x^2 + 27xy - 9$

4. [21] Evaluate each expression below using the given values for the variables. **NOTE: Partial credit will not be awarded unless work is shown.**

a. $6c - 10d - [-15]$,
 when $c = 5$ and $d = -1$

1. Substitute the given values for the variables.
 $6(5) - 10(-1) - [-15]$

2. Change all subtraction to adding the opposite.
 $6(5) + [-10](-1) + [+15]$

3. Simplify using the Order of Operations.

30	$+$	10	$+$	15
		40		$+$
				15

Answer: 55

b. $-2m^2 - 8mn + 6p^3 - 17$,
 when $m = -3$, $n = 6$,
 and $p = -4$

1. Substitute the given values for the variables.
 $-2(-3)^2 - 8(-3)(6) + 6(-4)^3 - 17$

2. Change all subtraction to adding the opposite.
 $-2(-3)^2 + [-8](-3)(6) + 6(-4)^3 + [-17]$

3. Simplify using the Order of Operations.

$-2(9)$	$+$	$(24)(6)$	$+$	$6(-64)$	$+$	$[-17]$
$[-18]$	$+$	144	$+$	$[-384]$	$+$	$[-17]$
				$[-18]$		144
				$[-384]$		
				$+ [-17]$		144
				$[-419]$	$+$	144

Answer: -275

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c. $-5x(y^2 - 3xy) + 2y^3$
when $x = 3$ and $y = -2$

1. Substitute the given values for the variables.

$$-5[3][(-2)^2 - 3[3][(-2)] + 2[-2]^3$$

2. Change all subtraction to adding the opposite.

$$-5[3][(-2)^2 + [-3][3][(-2)] + 2[-2]^3$$

3. Simplify using the Order of Operations.

$$-15(4 + [-3][3][(-2)] + 2[-8]$$

$$-15(4 + 18) + [-16]$$

$$-15(22) + [-16]$$

$$-330 + [-16]$$

$$\text{Answer: } -346$$

5. [10] Sherrie bought 5 pounds of 80% lean ground beef for \$3.09 per pound, 2 cans of tomatoes for 77¢ per can, and a gallon of milk for \$3.49.

a. Write an expression that can be used to determine how much she spent all together.

$$\text{Answer: } 5(3.09) + 2(0.77) + 3.49$$

b. Evaluate your expression from Part a to find out how much she spent altogether.

$$\text{Answer: } 15.45 + 1.54 + 3.49 = \$20.48$$

6. [15] Translate each phrase below into an algebraic expression.

a. the product of 14 and j

$$\text{Answer: } 14j \text{ or } 14 \times j \text{ or } 14 \cdot j \text{ or } 14 * j \text{ or } 14(j) \text{ or } (14)j \text{ or } (14)(j)$$

b. increase y by the product of twelve and z

$$\text{Answer: } y + 12z \text{ or } 12z + y$$

c. 55 less than $\frac{3}{10}$ of q

$$\text{Answer: } \frac{3}{10}q - 55$$

d. the sum of m and n , divided by 13

$$\text{Answer: } (m+n) \div 13 \text{ or } \frac{m+n}{13}$$

e. the difference of 8 and the product of y and z .

$$\text{Answer: } 8 - yz$$