NAME: _____ DATE:_____

ALGEBRA UNIT TEST

Knowledge	Thinking	Communication
/40	/16	/14

Show your work for all of the following questions!

1. Add. Arrange your answer in descending order. (6K)

__/3K a) $(3x - 7x^5 + 9) + (-7x^5 + 9 + 7x)$

$= 10x - 14x^5 + 18 \Rightarrow -14x^5 + 10x + 18$

__/3K b) $(-5x^3 + 3x^4 - 7) + (-5x^4 + 5 + 9x^3)$

$4x^3 - 2x^4 - 2 \Rightarrow -2x^4 + 4x^3 - 2$

2. Subtract the polynomials. Arrange your answer in descending order. (9K)

__/3K a) $(-2x^5 + 5x) - (-x + 2 + 3x^5)$

$= -2x^5 + 5x + x - 2 - 3x^5 = -5x^5 + 6x - 2$

__/3K b) $(9p^4 + 9p^3 - 2p) - (8p^4 + p^3 - 5p^2 + 6p)$

$p^4 + 8p^3 - 8p + 5p^2 \Rightarrow p^4 + 8p^3 + 5p^2 - 8p$

__/3K c) Subtract $7x^3 - 8x^2 + 4x$ from $6x^3 + 3x^2 + 10x$

sub 3 from 5, "5 - 3" = 2

$= 6x^3 + 3x^2 + 10x - (7x^3 - 8x^2 + 4x)$

$= -x^3 + 11x^2 + 6x$

3. Expand and simplify. Arrange answers in descending order. (5K)

a) $6(9n - 2) + 5(5 - 3n)$ __/2K

$= 54n - 12 + 25 - 15n$

$= 39n + 13$

b) $3t(2t^2 - 3t + 1) - 2(t^2 - 4t + 5)$ __/3K

$= 6t^3 - 9t^2 + 3t - 2t^2 + 8t - 10$

$= 6t^3 - 11t^2 + 11t - 10$

4. Multiply (7K)

a) $(-4x^2y^3)(7xy^3)$ __/1.5K

$= -28x^3y^6$

b) $(-6x^3y^2)(2xy^3)$ __/1.5K

$= -12x^4y^5$

c) $(-7abc)(-3ab)$ __/2K

$= 21a^2b^2c$

d) $(-2r^2s^2t^3)(-4rst^2)$ __/2K

$= 8r^3s^3t^5$

5. Simplify (13K)

a) $(-7x^2y^3)(-8xy^5)^0$ __/2K

$(-8xy^5)^0 = 1$

$= -7x^2y^3$

b) $(4z^8pu^4)^2$ __/2K

$= 16z^{16}p^2u^8$

c) $(-x^3)^2$ __/1K

$= x^6$

d) $(p^2q^3)^5$ __/2K

$= p^{10}q^{15}$

e) $(xy)^2(x^2y)$ __/2K

$= (x^2y^2)(x^2y) = x^4y^3$

f) $(-3rst^2)^3(2r^2s^3t)^2$ __/4K

$= (-27r^3s^3t^6)(4r^4s^6t^2)$

$= -108r^7s^9t^8$

6. Divide (7 marks T)

a) $\dfrac{-30m^5n^2 + 10m^2n - 15m^2}{5m^2}$ __/3T

$= -6m^3n^2 + 2n - 3$

b) $\dfrac{4x^3y^2z - 8x^2yz + 6x^4y^2z^3 - 1xy^3z^4}{-2x^2yz}$ __/4T

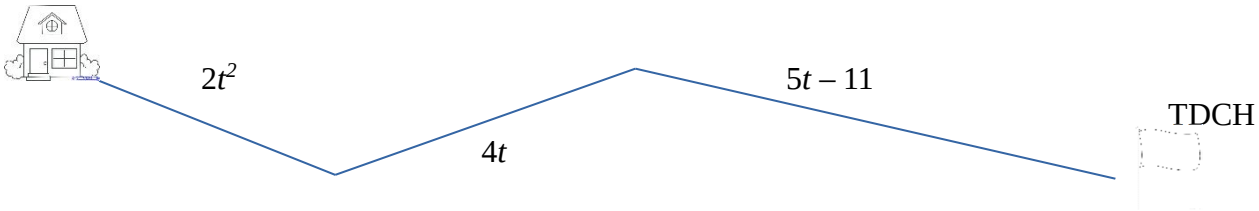
$= -2x^1y + 4 - 3x^2yz^2 + 0.5x^{-1}y^2z^3$

7. Classify each polynomial as a **monomial**, **binomial** or **trinomial**. State the ***degree*** of each. Arrange the polynomials in ***descending order***.

__/6T

	TYPE	DEGREE	DESCENDING ORDER
$3x + 7x^2$	binomial	2	$7x^2 + 3x$
$8x^2y^3z^1$	monomial	6	$8x^2y^3z$
$3a^4 - 5a + 2b^5$	trinomial	5	$2b^5 + 3a^4 - 5a$
$49 - 4t^2$	binomial	2	$-4t^2 + 49$

8. On his way to school, Mr. Heinbuch leaves his house, stops by the grocery store to buy ice cream sandwiches, gets some gas and then drives to TDCH. The time that each part of the trip takes is represented by a monomial (*t* represents *minutes*).



a) Write a **simplified polynomial expression** to determine the total time to school. __/2T

$2t^2 + 4t + 5t - 11$

$= 2t^2 + 9t - 11$

b) If t = 3 minutes, how long does it take Mr. Heinbuch to drive to school? Show your work and write a conclusion. __/1T__/1C

$= 2(3)^2 + 9(3) - 11$

$= 2(9) + 9(3) - 11$

$= 18 + 27 - 11 = 34$ minutes

Communication: Fill in the blanks then do the examples.

9.

a) When adding or subtracting polynomials, add or subtract the coeffients of the like terms and leave the exponents alone.

__/2C $3x^4y^2 - 5x^3y + 4x^3y + 10x^4y^2 =$ $13x^4y^2 - x^3y$

b) When multiplying, you multiply the coefficients and add the exponents of like ~~terms~~ variables.

$(3ab^4c^3)(-2a^5b^3c^2) =$ $-6a^6b^7c^5$

__/2C

c) Power law: you multiply the exponents.

$(2x^2y^5)^4 =$ $2^4x^8y^{20} = 16x^8y^{20}$

__/1C

d) When dividing, you divide the coefficients and subtract the exponents.

$\frac{-14x^3y^2z^6}{7xy^2z^4} =$ $-2x^2z^2$

__/2C

e) What is the rule of raising a power to the exponent zero?

$(-524ab^2c^{22}d^{10})^0 =$ 1

__/1C

Word Bank (*not all words will be used*)

Divide	Multiply	Add	Subtract	Coefficient
Variable	Like	Distributive	Term	Power