Unit 5: Polynomials Practice Test

Math 9 Principles

Name: _____ Block: ____

Please initial this box to indicate you carefully read over your test and checked your work for simple mistakes.

	What I can do in this unit	Level
5-1	I can identify, add, and subtract like terms.	
5-2	I can identify, add, and subtract monomials, binomials, trinomials, and quadrinomials and determine their degree.	
5-3	I can simplify products and quotients of monomials and use the **Distributive Property** when multiplying a monomial and a polynomial.	
5-4	I can use the **Distributive Property** to evaluate the product of two binomials (FOIL) or a binomial and a trinomial.	
5-5	I can write and simplify the quotient of a polynomial and a monomial as separate terms.	
5-6	I can factor polynomials using the **Greatest Common Factor** (**GCF**) method.	
5-7	I can factor factorials with a leading coefficient of one using the **Product Sum** technique and trinomials with a leading coefficient that is other than one using a combination of **GCF** and **Product Sum** technique.	
5-8	I can evaluate surface areas of composite shapes.	

Code	Value	Description
N	Not Yet Meeting Expectations	I just don't get it.
MM	Minimally Meeting Expectations	Barely got it, I need some prompting to help solve the question.
M	Meeting Expectations	Got it, I understand the concept without help or prompting.
E	Exceeding Expectations	Wow, nailed it! I can use this concept to solve problems I may have not seen in practice. I also get little details that may not be directly related to this target correct.

5-1 I can identify, add, and subtract like terms.

Simplify each expression:

1) $18c - -12c$ $= 18c + 12c$ $= 30c$	2) $15x^2 - 8x + 3x^2$ $= 18x^2 - 8x$
3) $15 - 6x$ $= 15 - 6x$	4) $5x - 4y + y - 5x$ $= -3y$
5) $2x + (-3x) + 2 - x - -5x - 1$ $= 2x - 3x + 2 - x + 5x - 1$ $= 3x + 1$	6) $(5 - r) + (12r - -8)$ $= 5 - r + 12r + 8$ $= 11r + 13$
7) $(-5y + 2x - 5) + (2x - 1)$ $= -5y + 2x - 5 + 2x - 1$ $= 4x - 5y - 6$	8) $(2z - 3y) + (z - y)$ $= 2z - 3y + z - y$ $= -4y + 3z$

5-2 I can identify, add, and subtract monomials, binomials, trinomials, and quadrinomials and determine their degree.

Simplify each expression:

9) $(5x - 12) - (2x + 2)$

$= 5x - 12 - 2x - 2$

$= 3x - 14$

10) $(4a - 5b) - (3b - a)$

$= 4a - 5b - 3b + a$

$= 5a - 8b$

11) $(5x^3 - 3x) - (-x^3 + x^2)$

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

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

12) $(-5x^2y + x^2 - y) - (5x^2y + 2x^2)$

$= -5x^2y + x^2 - y - 5x^2y - 2x^2$

$= -10x^2y - x^2 - y$

13) $(3x^2 - 5x + 7) - (-5x^2 - x - 6)$

$= 3x^2 - 5x + 7 + 5x^2 + x + 6$

$= 8x^2 - 4x + 13$

14) $-x - (5 - x) + 17 - (-x)$

$= -x - 5 + x + 17 + x$

$= x + 12$

15) $(-y^2 + y) - (-2y^3 + y^2)$

$= -y^2 + y + 2y^3 - y^2$

$= 2y^3 - 2y^2 + y$

16) $(2x^2 - 8) + (-x - 10) - (-x^2) - (4x^2 - 5x)$

$= 2x^2 - 8 - x - 10 + x^2 - 4x^2 + 5x$

$= -x^2 + 4x - 18$

17) How many terms does the expression $19x^4 - 5x^3 - 15x^2 + 6x - 7$ have?

5

18) Give the degree of the polynomial $5a^6b - 20a^2b^3 + 12a$.

7 (6 + 1)

19) Give the degree of the constant 15.

0

5-3 I can simplify products and quotients of monomials and use the Distributive Property when multiplying a monomial and a polynomial.

Simplify each expression:

20) $(5a)(-6a)$ $= -30a^2$	21) $(-5x^2)(-8x^3)$ $= 40x^5$
22) $(-5a^2b^4)(8ab^3)$ $= -40a^3b^7$	23) $(4xy^5)(-7xy)$ $= -28x^2y^6$
24) $(-a^2)^4(-3a^2)$ $= (a^8)(-3a^2)$ $= -3a^{10}$	25) $\frac{5x^5}{15x^3}$ $= \frac{x^2}{3}$
26) $\frac{56a^5}{7a}$ $= 8a^4$	27) $-3(2x-1)$ $= -6x+3$
28) $5b(-3b^2+2b-8)$ $= -15b^3+10b^2-40b$	29) $(x^2)(6x^2-15x+3)$ $= 6x^4-15x^3+3x^2$

5-4 I can use the Distributive Property to evaluate the product of two binomials (FOIL) or a binomial and a trinomial.

Simplify each expression:

30) $(x+6)(x+2)$

$= x^2 + 2x + 6x + 12$

$= x^2 + 8x + 12$

31) $(a-3)(a+9)$

$= a^2 + 9a - 3a - 27$

$= a^2 + 6a - 27$

32) $(x-8)(x-1)$

$= x^2 - x - 8x + 8$

$= x^2 - 9x + 8$

33) $(x-3)(x-15)$

$= x^2 - 15x - 3x + 45$

$= x^2 - 18x + 45$

34) $(x+4)(x-5)$

$= x^2 - 5x + 4x - 20$

$= x^2 - x - 20$

35) $(2x-5)^2$

$= (2x-5)(2x-5)$

$= 4x^2 - 10x - 10x + 25$

$= 4x^2 - 20x + 25$

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

$= x^3 - 5x^2 - x + 2x^2 - 10x - 2$

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

37) $(x-2)^3$

$= (x-2)(x-2)(x-2)$

$(x-2)(x-2) = x^2 - 2x - 2x + 4$

$= x^2 - 4x + 4$

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

$= x^3 - 2x^2 - 4x^2 + 8x + 4x - 8$

$= x^3 - 6x^2 + 12x - 8$

5-5 I can write and simplify the quotient of a polynomial and a monomial as separate terms.

Divide. Write as separate quotients first, then reduce:

38) $\frac{15a-10}{5}$

$= \frac{15a}{5} - \frac{10}{5}$

$= 3a - 2$

39) $\frac{27y-9}{9}$

$= \frac{27y}{9} - \frac{9}{9}$

$= 3y - 1$

40) $\frac{6k^2+15k}{3}$

$= \frac{6k^2}{3} + \frac{15k}{3}$

$= 2k^2 + 5k$

41) $\frac{(-16c+24d+72)}{4}$

$= \frac{-16c}{4} + \frac{24d}{4} + \frac{72}{4}$

$= -4c + 6d + 18$

42) $\frac{-24x^3+20x^2-4x}{-4}$

$= \frac{-24x^3}{-4} + \frac{20x^2}{-4} - \frac{4x}{-4}$

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

43) $\frac{12a^2-9a^6}{-3a^2}$

$= \frac{12a^2}{-3a^2} - \frac{9a^6}{-3a^2}$

$= -4 + 3a^4$

$= 3a^4 - 4$

44) $\frac{a^2b-4ab^2-ab^3}{ab}$

$= \frac{a^2b}{ab} - \frac{4ab^2}{ab} - \frac{ab^3}{ab}$

$= a - 4b - b^2$

$(= -b^2 + a - 4b)$

45) $\frac{16x^2y+24x^2y^2}{4y}$

$= \frac{16x^2y}{4y} + \frac{24x^2y^2}{4y}$

$= 4x^2 + 6x^2y$

$= 6x^2y + 4x^2$

5-6 I can factor polynomials using the Greatest Common Factor (GCF) method.

46) $24x^3 - 12x^2$ $= 12x^2(2x - 1)$	47) $-16x^4 + 40x^3$ $= -8x^3(2x - 5)$
48) $6x^2 - 36x$ $= 6x(x - 6)$	49) $81x^3 + 18x^2 - 27x$ $= 9x(9x^2 + 2x - 3)$
50) $15x^2y^2 - 25x^2y$ $= 5x^2y(3y - 5)$	51) $a^3 - 15a^2 + 3a$ $= a(a^2 - 15a + 3)$
52) $15x^3y^2 - 12x^2y^3 + 3x^2y^2$ $= 3x^2y^2(5x - 4y + 1)$	53) $16a^4b^2 - 4a^2b^2 - 8a^2b$ $= 4a^2b(4a^2b - b - 2)$

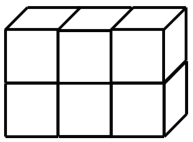
5-7 I can factor factorials with a leading coefficient of one using the Product Sum technique and trinomials with a leading coefficient that is other than one using a combination of GCF and Product Sum technique.

54) $x^2 + 5x + 6$ $=(x+3)(x+2)$	55) $x^2 - 6x - 16$ $=(x-8)(x+2)$
56) $x^2 - 11x + 18$ $=(x-2)(x-9)$	57) $x^2 - 3x - 10$ $=(x-5)(x+2)$
58) $2x^2 - 8x - 10$ $=2(x-4x-5)$ $=2(x-5)(x+1)$	59) $3x^2 + 15x + 18$ $=3(x^2+5x+6)$ $=3(x+3)(x+2)$
60) $x^3 - 3x^2 + 2x$ $=x(x^2-3x+2)$ $=x(x-1)(x-2)$	61) $-x^2 + 5x + 36$ $=-(x^2-5x-36)$ $=-(x-9)(x+4)$

5-8 I can evaluate surface areas of composite shapes.

Find the surface area of each shape.

62)



$=6 \cdot 6$

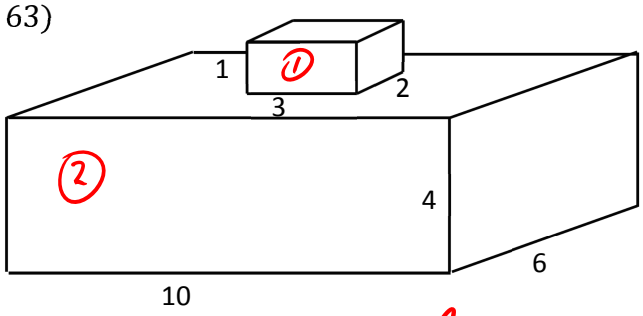
$=36$ sides total

7 shared sides

$7 \cdot 2 = 14$

$36 - 14 = 22 \text{ units}^2$

63)



SA_1 $1 \cdot 3 \cdot 2 = 6$

$1 \cdot 2 \cdot 2 = 4$

$2 \cdot 3 \cdot 2 = 12$

22

SA_2 $4 \cdot 10 \cdot 2 = 80$

$6 \cdot 10 \cdot 2 = 120$

$4 \cdot 6 \cdot 2 = 48$

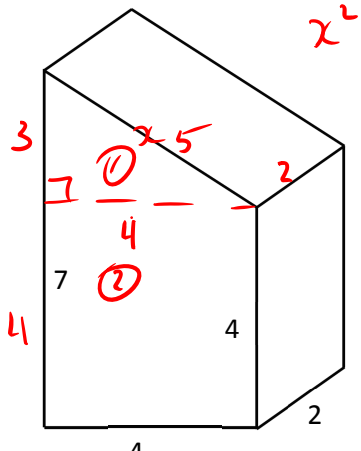
248

Shared: $3 \cdot 2 \cdot 2 = 12$

Net SA $= 22 + 248 - 12$

$= 258$

64)



$x^2 = 3^2 + 4^2$

$= 9 + 16$

$x = \sqrt{25}$

$x = 5$

SA_1: $\frac{1}{2}(3)(4)(2) = 12$ F+B

$3 \cdot 2 = 6$ L

$5 \cdot 2 = 10$ T

28

SA_2: $4 \cdot 4 \cdot 2 = 32$ F+Back

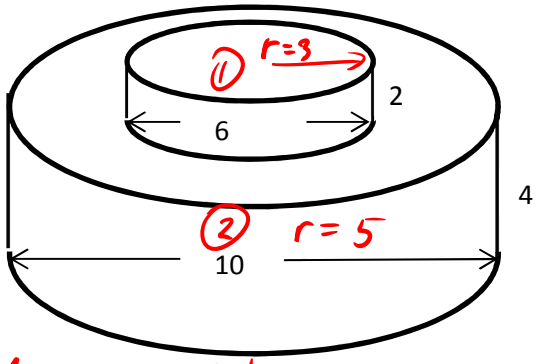
$4 \cdot 2 \cdot 2 = 16$ L+R

$4 \cdot 2 = 8$ B (Not Tp)

56

Net SA $= 56 + 28 = 84$

65)



SA_1: $= 2\pi rh$

$= 2\pi 3 \cdot 2$

$= 12\pi$

SA_2: $SA = 2\pi r^2 + 2\pi rh$

$= 2\pi 5^2 + 2\pi 5 \cdot 4$

$= 50\pi + 40\pi$

$= 90\pi$

Net $= 102\pi$