Name: _____

IM2 Semester 1 Final Exam Review B
(Study Guide Questions 22-24 & 13-18)

Multiplying Polynomials

To multiply a group by a term (problems 22–24):

Multiply both terms inside the parentheses by the term in front.

The front numbers (coefficients) <u>only</u> multiply with the other front numbers.

If there is only one term with a front number, keep the number the same.

The *x*-values <u>only</u> multiply with each other, and <u>only</u> the exponent changes.

Add the exponents of x.

If there is only one term with an x, keep the x the same.

Remember: $(+)(+) = +\ and\ (-)(-) = +$ BUT $(+)(-) = -\ and\ (-)(+) = -$

Same signs make +, but different signs make -!

1. Distribute by multiplication. $-4x(6x + 8)$	2. Distribute by multiplication. $-7x(6x - 2)$	3. Distribute by multiplication. $5x(-3x - 6)$
4. Distribute by multiplication. $3x(-6x + 1)$	5. Distribute by multiplication. $x(-4x + 1)$	6. Distribute by multiplication. $9x(5x - 6)$
7. Distribute by multiplication. $-2x(-2x - 5)$	8. Distribute by multiplication. $-2x(6x + 3)$	9. Distribute by multiplication. $3x(2x + 5)$

To multiply two groups with the same variable (problems 13–15):

Multiply both terms inside the first parentheses by both terms inside the first parentheses.

The front numbers (coefficients) <u>only</u> multiply with the other front numbers.

If there is only one term with a front number, keep the number the same.

The variables <u>only</u> multiply with each other, and, when they multiply, <u>only</u> the exponent changes.

Add the exponents *of the variables (the invisible or "missing" exponent is 1).*

If there is only one term with a variable, keep the variable the same.

Add or subtract the front numbers for any set of terms that have the same variable with the same exponent.

Remember: $(+)(+) = +\ and\ (-)(-) = +$ BUT $(+)(-) = -\ and\ (-)(+) = -$

Same signs make +, but different signs make - !

10. Find $(5a + 7)(-8a + 8)$.	11. Find $(7b + 3)(-5b + 6)$.	12. Find $(7c - 4)(6c - 7)$.
13. Find $(-3d + 8)(-3d - 9)$.	14. Find $(-5g - 5)(-7g + 6)$.	15. Find $(-3h - 2)(-2h + 6)$.

Name: _____

16. Find $(k+7)(-6k+9)$.	17. Find $(-9m+6)(-2m+4)$.	18. Find $(7n-1)(-5n+6)$.

To multiply two groups with *y*- & *z*-values (problems 16–18):

Multiply both terms inside the first parentheses by both terms inside the first parentheses.

The front numbers (coefficients) only multiply with the other front numbers.

If there is only one term with a front number, keep the number the same.

A *variable* can only multiply with the same letter, and, when they multiply, only the exponent changes.

Add the exponents *of the same-letter variables (the invisible or "missing" exponent is 1).*

Different-letter variables are written next to each other in alphabetical order.

For example: $(-4z)(3y) = -12yz$

Add or subtract the front numbers for any set of terms that have the same variable with the same exponent.

19. Find $(-8y-z)(3y-5z)$.	20. Find $(5y+7z)(8y-6z)$.	21. Find $(7y-2z)(7y+2z)$.
22. Find $(-9y+3z)(5y-4z)$.	23. Find $(5y+6z)(5y-6z)$.	24. Find $(-y+2z)(6y+z)$.
25. Find $(6y-z)(6y+z)$.	26. Find $(4y-5z)(4y+5z)$.	27. Find $(3y+2z)(8y+2z)$.

Answers

1. $-24x^2-32x$	2. $-42x^2+14x$	3. $-15x^2-30x$
4. $-18x^2+3x$	5. $-4x^2+x$	6. $45x^2-54x$
7. $4x^2+10x$	8. $-12x^2-6x$	9. $6x^2+15x$
10. $-40a^2-16a+56$	11. $-35b^2+27b+18$	12. $42c^2-73c+28$
13. $9d^2+3d-72$	14. $35g^2+5g-30$	15. $6h^2-14h-12$
16. $-6k^2-33k+63$	17. $18m^2-48m+24$	18. $-35n^2+47n-6$
19. $-24y^2+37yz+5z^2$	20. $40y^2+26yz-42z^2$	21. $49y^2-4z^2$
22. $-45y+51yz-12z^2$	23. $25y^2-36z^2$	24. $-6y^2+11yz+2z^2$
25. $36y^2-z^2$	26. $16y^2-25z^2$	27. $24y^2+22yz+4z^2$