Simplifying and Combining Like Terms:

Take a look at: $7x^2$

7 is called the coefficient, x is called the variable or base, and 2 is called the exponent!

Like Terms – terms that have identical variable parts (same variable and same exponent.)

When simplifying using addition and subtraction, combine "like terms" by keeping the "like term" and adding or subtracting the numerical coefficients.

Examples:
1) $10x + x = 11x$ 2) $100xy - 17xy = 83xy$ 3) $16x^3y^2 - 4x^3y^2 = 12x^3y^2$

Why can't you simplify the following?
4) $8x^3 + 8x^2$ 5) $13x^2 - 6x$ 6) $12xy^4 + 3x^4y$ 7) $15ab - 10ac$

WORKING WITH THE DISTRIBUTIVE PROPERTY

Example:
$3(2x - 5) + 5(3x + 6) =$
Since in the order of operations, multiplication comes before addition and subtraction, we must get rid of the multiplication before you can combine like terms. We do this by using the distributive property:

$3(2x - 5) + 5(3x + 6) =$
$3(2x) - 3(5) + 5(3x) + 5(6) =$
$6x - 15 + 15x + 30 =$

Now you can combine the like terms: $6x + 15x = 21x - 15 + 30 = 15$

Final answer: $21x + 15$

Simplify each of the following (if possible):
1) $(6x) + (-4x) + (-5x) + (10x)$ 2) $-5y + 6y + 9y - 14y$

3) $(7c) + (-15c) + (2c) + (12c)$ 4) $(8x^2) + (-x^2) + (-12x^2) + 2x^2)$

5) $7x + 5 - 3x + 10$ 6) $6d^2 - 9d + 11d^2 + 16d$

7) $(6x + 4) + (15 - 7x)$ 8) $(12x - 5) - (7x - 11)$

9) $14a^2b - 16ab^2$ 10) $17a - 34c + 54b + 16a$

11) $15ab + 17ab + 19ab - 16ab$

12) $88x^2 - 22x^5 + 66x^7 - 88x^2 + 22x^5$

13) $17xyz - 34xyz - 8xyz + 3xy$

14) $8a^6 - 13a^6 + 12a^6 - 8b^6$

15) $22p - 8p^6 + 5p - 5p^2 - 12p^6$
1,100xy

16) $1,100ab - 2,400xy + 1,700ab -$

17) $56def - 100def - 15df$
6qrstuvwxyz

18) $18abcdefgh - 2ijklmnop +$

19) $12ab^2 + 13a^2b - 10a^2b + 13ab^2$

20) $44abc^2 - 16abc + 66abc^2 - 12\ ab^2c$

Show all work on looseleaf. Make sure answers are in simplest form.

1. $3ab - 2ab =$

12. $-c^2(8c - 3c^2) =$

2. $(2a - 3b + c) + (5b - 6c) =$

13. $(2x^2 - x + 3)(x + 3) =$

3. $5by^2 - 4by^2 =$

14. $(x + 4)^3 =$

4. $(-3k + 2) - (-8k + 3) =$

15. $5(x - 2) + 10 =$

5. $(x^2 - 5x - 6) - (2x^2 - 3x - 6) =$

16. $(y^2)^3 + (y^3)^2 =$

6. $(3x^3)(2x^2) =$

17. $(y + 2)^2 - y^2 =$

7. $(-m)(8m) =$

18. $x(x - 8) - 2x(x - 3) =$

8. $(9ab)(2ab^3) =$

19. $\dfrac{18a - 6b}{6} =$

9. $(5a^2b^4)^3 =$

10. $-4(2a-b)=$

11. $5x(x + 3)=$

20. $\dfrac{4y^2 - 2ay}{2y} =$

21. $\dfrac{28t^3 - 21t^4}{7t^3} =$

22. $\dfrac{6a^2b - 3ab^2 + 3ab}{3ab} =$