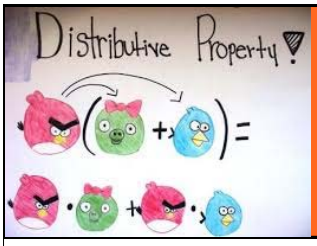


Unit 3: Polynomials

3.6 Greatest Common Factor

Expanding versus Factoring

Previously, we learned how to multiply polynomials together; also called EXPANDING.

For example:

i) $2x(x + 5)$ = $2x^2+10x$

ii) $(x + 3)(x + 2)$ = x^2+5x+6

iii) $(2x + 3)(x + 4)$ = $2x^2+11x+12$

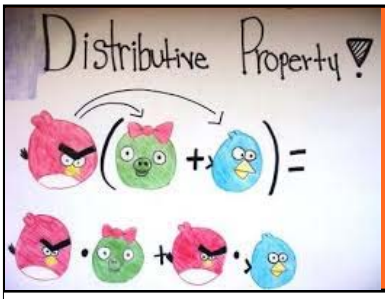
Now we will study the opposite of this: FACTORING.

For example:

i) $2x^2 + 10x$ = $2x(x+5)$

ii) $x^2 + 5x + 6$ = $(x+3)(x+2)$

iii) $2x^2 + 11x + 12$ = $(2x+3)(x+4)$



The GCF of a set of terms is the largest number and/or number of variables that you can evenly divide out of all terms.

Ex.) What is the greatest common factor of each set of monomials.

a) $12ab$, $15a^2b^3$

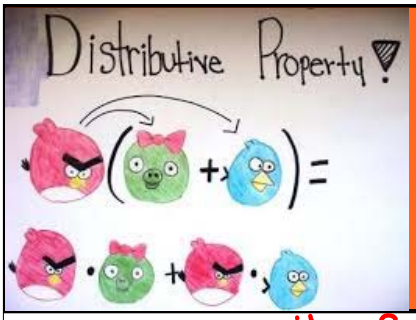
GCF: $3ab$

b) $18x^4y^2$, $-24x^3y^5$ $\quad x\cdot x\cdot x\cdot x\cdot y\cdot y$ $\quad x\cdot x\cdot x\cdot y\cdot y\cdot y\cdot y\cdot y$

GCF: $6x^3y^2$

c) $-40a^3b$, $-20a^2b^3$, $-10a^2b^2$

GCF: $-10a^2b$



- opposite of expanding.

Ex.) Factor each polynomial by removing the gcf.

a) $20x - 6$ (2, 2)

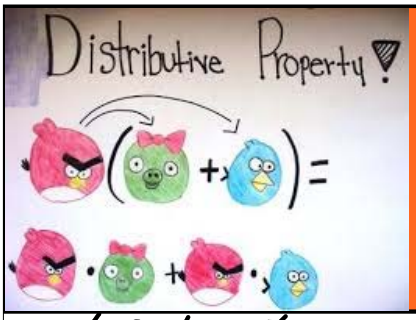
$2(10x-3)$

b) $16x^4 + 4x^2$ ($4x^2$, $4x^2$)

$4x^2(4x^2+1)$

c) $10a^3b^2 + 8ab^3$ ($2ab^2$, $2ab^2$)

$2ab^2(5a^2+4b)$



d) $12p^3 - 6p^2 + 15p$ ($3p$, $3p$, $3p$)

$3p(4p^2-2p+5)$

e) $25xy^2z^3 - 20x^2y^4z^2 + 30x^4y^2z^5$ ($5xy^2z^2$, $5xy^2z^2$, $5xy^2z^2$)

$5xy^2z^2(5z-4xy^2+6x^3z^3)$

You should always double check your answer by expanding. When you multiply your solution you should get what you started with.