* **Like terms:** 1) The same variable
2) The same Power.

* $5x$, $3x$, $7x$, $\frac{1}{2}x$, $-\frac{5}{2}x$
* $7xy$, $2xy$, $\frac{3}{2}xy$, $-\frac{5}{4}xy$
* $7x$, $9x^2$, $7y$, $-3z$ Not like

Terms , Coefficient , variable , expression.

$$5x + 3y + 7$$

1) Polynomial.
2) 5, 3 → Coefficient
3) x, y → variables.
4) $5x$, $3y$ → algebraic terms.
5) 7 → free term.
6) $5x + 3y + 7$ → expression.

---

* **Polynomial:**
  * Positive , Integer Power.

* $5x^{\checkmark} + 3y^{\checkmark}$ Polynomial
* $7x^{2\checkmark} + 5x^{\checkmark} + 9^{\checkmark}$ Polynomial
* $7y + 21\sqrt{y}^{\checkmark}$ Not Polynomial.
* $\frac{5}{x} + 7 \rightarrow 5x^{-1} + 7$ Not Polynomial.

---

monomial → one term → $7x$, $5x$, $3y$,

binomial → Two terms → $7x+y$, $5x-4y$

Trinomial → Three terms → $5x+7y-3$

Polynomial → at least one term.

Adding & subtract:

$5x + 3x = 8x$

$7x^2 - 2x^2 = 5x^2$

$4xy + 7xy = 11xy$

$5x + 3y = 5x + 3y$

Multiply:

$3x(x+5) = 3x^2 + 15x$

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

$5xy(2x + 3y - 7) =$

$10x^2y + 15xy^2 - 35xy$

Note:

$x^m \cdot x^n = x^{m+n}$

$x^m \div x^n = x^{m-n}$

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

$= 2x^2 + x - 15$

$(5x-4)(3x+7) = 15x^2 + 35x - 12x - 28$

$= 15x^2 + 23x - 28$

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

outer, Inner

$2x^2 + x - 15$

First, Middle, Last free

First = First X First

Middle = Inner + outer / Last = Last X last

$(ax + 3)(5x - 7) = 20x^2 + cx - 21$

Find c ?

$5a = 20 \rightarrow a = 4$

$c = 15 - 7a$

$15 - 7(4) = 15 - 28 = -13$

$5a\,x^2 - 7ax + 15x - 21 = 20x^2 + cx - 21$

$5a = 20 \rightarrow a = 4$

$c = -7a + 15$

$= -7(4) + 15 = -13$ ✓

---

* Expand:

$(x+y)^2 = (\text{first})^2 + 2 \times \text{First} \times \text{Last} + (\text{last})^2$

$= x^2 + 2xy + y^2$

$(x+5)^2 = x^2 + 2(x)(5) + 25$

$x^2 + 10x + 25$

$(2x-7)^2 = 4x^2 - 2(2x)(7) + 49$

$4x^2 - 28x + 49$

$(x+y)(x-y) = (\text{First})^2 - (\text{Second})^2$

$= x^2 - y^2$

$(x+5)(x-5) = x^2 - 25$

$(2x+3)(2x-3) = 4x^2 - 9$