

① $x^2 + bx + c$

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

sign of element of the sum

$(x+3)(x+2)$

$a \cdot c = 2 \cdot 3 = 6$

$(2x^2 + 3x) + (2x + 3)$ sum

$(2x^2 + 2x) + (3x + 3)$

$x(2x+3) + 1(2x+3)$ $2x(x+1) + 3(x+1)$

$(2x+3)(x+1)$ $(x+1)(2x+3)$

$3x^2 + 8x + 4$ $a \cdot c = 12$ $b = 8$

sum

$(3x^2 + 6x) + (2x + 4)$

$3x(x+2) + 2(x+2)$ $(x+2)(3x+2)$

$$x^2 + 7x + 12$$

product = c 1 · 12
 sum = b 2 + 6
 3 + 4

$$(x + 3)(x + 4)$$

$$3x^2 + 22x + 7$$

product = ac
 sum = 22

$ac = -21$

$$(3x^2 + 21x) + (x + 7)$$

$$3x(x + 7) + 1(x + 7)$$

$$(x + 7)(3x + 1)$$

$$3x^2 + 1x + 21x + 7$$

$$6x^2 + 19x + 10 \quad a = 60 \quad b = 19 \quad 15 \cdot 4$$

$$(6x^2 + 15x) + (4x + 10)$$

$$3x(2x + 5) + 2(2x + 5)$$

$$(2x + 5)(3x + 2)$$

$$4x^2 - 12x + 5$$

$$ac = 20 \quad b = 12$$

10 & 2

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

$$2x(2x - 5) - 1(2x - 5)$$
$$(2x - 5)(2x - 1)$$

$$7x^3 - 22x^2 + 3x$$

$$x(7x^2 - 22x + 3) \quad ac = 21 \quad b = -22$$

$$x(7x^2 - 1x - 21x + 3) \quad 1 \text{ & } 21$$

$$x[(7x^2 - 1x) + (-21x + 3)]$$

$$x[x(7x - 1) - 3(7x - 1)]$$

$$x(7x - 1)(x - 3)$$

$$x^2 - 9x + 20$$

$$(x - 5)(x - 4)$$

sum b
prod c

$$20x^3y^2 - 4x^2y^2 + 84xy^2$$

$$4x^2y^2(5x^2 - [x+21])$$

$$ac = 5 \cdot 21 = 105 \quad b = 1$$

prod sum

prime /
not factorable

1. Is there a
common factor
"number"
"variable"
"both"

2. Re-write the
question

$$3a^2 + 10ab + 3b^2$$

$$ac = 9$$

$$(3a^2 + 1ab) + (9ab + 3b^2)$$

$$b_{sum} = 10$$

$$a(3a+b) + 3b(3a+b)$$

$$(3a+b)(a+3b)$$

Cat 3. $ax^2 + bx - c$

f c
prod
sum

$$3x^2 + x - 2$$

- c
prod
diff

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

$$3x(x+1) - 2(x+1)$$

$$ac = 6$$

$$b = 1$$

$$(x+1)(3x-2)$$

$$2 \text{ and } 3$$

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

prod/diff

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

$$20$$

$$8$$

$$10 \text{ and } 2$$

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

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

$$x^2 + x - 6$$

$$(x + 3)(x - 2)$$

$$4x^2 + 2x + 5$$

$$4x^2 + \underline{20x} + x + 5$$

prod/sum
20 2k

$$4x^2 - 21x + 5$$

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

prod/sum
20 2

$$4x^2 - 8x - 5$$

prod/def
20 8
10 2

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

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

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

$$6x^2 - 19xy - 7y^2$$

p/d
42 19
21 2

$$(6x^2 - 21xy) + (2xy - 7y^2)$$

$$3x(2x - 7y) + y(2x - 7y)$$

$$(2x - 7y)(3x + y)$$