Factoring Synthesis

FACTORING FLOW CHART

STEP 1 Take out COMMON FACTORS (**GCF**)

STEP 2 Ask: How many terms are there?

TWO

Probably a **difference of squares:**

*You need **subtraction** ("difference") and **squares**

$a^2 - b^2 = (a + b)(a - b)$

Diff of Sqs = Conjugates

Example:

$4x^2 - 9$

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

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

THREE

Factoring **trinomials:**

$ax^2 + bx + c$

Type 1: a = 1

Example:

$x^2 - 3x + 2$

Ask: what ADDS to "b" (here –3) & MULTIPLIES to "c" (here +2)

Answer: –1, –2

Write factors

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

Type 2: a ≠ 1

Example:

$2x^2 - x - 1$

Ask: what ADDS to "b" (here –1) & MULTIPLIES to "ac" (here 2(–1)= – 2)

Answer: –2, 1

Use these to split the middle term into two separate terms:

$2x^2 - x - 1$

$2x^2 - 2x + 1x - 1$

Factor using grouping:

See next column ☺

FOUR

Probably **grouping**:

Example:

$2x^2 - 2x + 1x - 1$

Group the first two terms together, and the last two terms together:

$[2x^2 - 2x] + [1x - 1]$

Factor common factors out of each group:

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

You should have two matching brackets. Factor them out:

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

STEP 3 Ask: **FF?** Look inside each factor (bracket) and see if you can **FACTOR FURTHER.**