GUIDED NOTES (MODEL NOTES)

Factor each polynomial.

1) $x^2+2x-15$ $GCF:1$

$(1x\ \ )(1x\ \ )$ $a:1\cdot1$

$(1x\ 3)(1x\ 5)$ $c:1\cdot15,\ 3\cdot5$

$-3x$ $diff.\ of\ 2$

$+5x$ $\uparrow\quad\uparrow$

$-c\quad|b|$

$\boxed{(x-3)(x+5)}$

2) $2x^2-16x+24$ $GCF:2$

$2(x^2-8x+12)$ $a:1\cdot1$

$\boxed{2(x-2)(x-6)}$ $c:1\cdot12,\ 2\cdot6,\ 3\cdot4$

$-2x$ $sum\ of\ 8$

$-6x$ $\uparrow\quad\uparrow$

$+c\quad|b|$

3) $x^2+10x+24$ $GCF:1$

$\boxed{(x+4)(x+6)}$ $a:1\cdot1$

$c:1\cdot24,\ 2\cdot12,\ 3\cdot8,\ 4\cdot6$

$sum\ of\ 10$

$\uparrow\quad\uparrow$

$+c\quad|b|$

4) x^2-16 $GCF:1$

$x^2+0x-16$ $a:1\cdot1$

$\boxed{(x+4)(x-4)}$ $c:1\cdot16,\ 2\cdot8,\ 4\cdot4$

$diff.\ of\ 0$

$\uparrow\quad\uparrow$

$-c\quad|b|$

1) Find and factor out the GCF.

2) Find the factors of a.

3) Find the factors of $|c|$.

4) Decide if you need a sum or difference of $|b|$.

- If $+c$, then you need a **sum**.
- If $-c$, then you need a **difference**.

5) Find the right pair of a and c values such that the products of the factors of a and c have a sum/difference of $|b|$.

6) Write the two factors.

- Coefficients are from the factors of a.
- Constants are from the factors of c.
- Use c and b to determine the $\pm$ symbols.
  - If $+c$, then the signs are the **same**.
  - If $-c$, then the signs are **different**.
  - The bigger product gets the same sign as b.

GUIDED NOTES (MODEL NOTES)

Factor each polynomial.

1) $5x^2+23x+24 \quad GCF:1$

$(1x\ \ )(5x\ \ )$

$(1x\ 3)(5x\ 8)$

$+15x$

$+8x$

$a:1\cdot 5$

$c:1\cdot 24,\ 2\cdot 12,\ 3\cdot 8,\ 4\cdot 6$

$sum\ of\ 23$

$\uparrow \quad \uparrow$

$+c \quad |b|$

$\boxed{(x+3)(5x+8)}$

2) $12x^2+51x-45 \quad GCF:3$

$3(4x^2+17x-15)$

$\boxed{3(x+5)(4x-3)}$

$+20x$

$-3x$

$a:1\cdot 4,\ 2\cdot 2$

$c:1\cdot 15,\ 3\cdot 5$

$diff.\ of\ 17$

$\uparrow \quad \uparrow$

$-c \quad |b|$

3) $-12x^2+x+20 \quad GCF:-1$

$-1(12x^2-x-20)$

$\boxed{-1(3x-4)(4x+5)}$

$-16x$

$+15x$

$a:1\cdot 12,\ 2\cdot 6,\ 3\cdot 4$

$c:1\cdot 20,\ 2\cdot 10,\ 4\cdot 5$

$diff.\ of\ 1$

$\uparrow \quad \uparrow$

$-c \quad |b|$

If $a>0$, then the GCF is positive.

If $a<0$, then the GCF is negative.