FACTORING SUMMARY

*(what to do…and when to do it!)*

**START**

**>4 TERMS**

**4 TERMS**

**3 TERMS**

**2 TERMS**

SUM AND DIFFERENCE OF CUBES

DIFFERENCE OF SQUARES
(perfect square trinomial and monomial)

**OR**

FACTOR BY GROUPING

**LOOK FOR**

**COMMON FACTORS**

**FIRST!**

**OR**

**OR**

**OR**

**OR**

DIFFERENCE OF PERFECT SQUARE

TRINOMIALS

(6 terms only)

FACTOR BY GROUPING

(2 pairs)

DIFFERENCE OF SQUARES

SIMPLE TRINOMIAL

PERFECT SQUARE TRINOMIAL

COMPLEX TRINOMIAL

**A) FACTORING POLYNOMIALS**

**1) COMMON FACTOR**

* find the common largest number and variable combination that go into each term
* divide each term by the common factor after you place the GCF in front of the brackets.

**Ex**. Factor 6x3 – 12x2 + 24x 6x(x2 – 2x + 4)

**2) DIFFERENCE OF SQUARES a2 – b2 = (a +b)(a – b)**

* when a2 – b2 , the two factors are (a + b) and (a – b)

**Ex**. Factor 36x2 – 49y2

y)

**3) SIMPLE TRINOMIAL** **x2 + 5x +6**

* when x2 + Bx + C, i.e. the coefficient of the x2 term is 1

|  |  |
| --- | --- |
| **Ex1.** **Factor x2 + 5x + 6**two numbers that **multiply** to 6 and **add** to 5 are: 3 an  | **Ex2.** **Factor x2 – 6x – 7** two numbers that **multiply** to -7 and **add** to -6 are: 1 and -7 |

**4) COMPLEX (TRICKY) TRINOMIAL** 6x2 – x – 12

**Ex.** Factor 6x2 – x – 12

|  |  |
| --- | --- |
| **DECOMPOSITION METHOD** | **AUSTRALIAN METHOD** |

**B) SOLVING QUADRATIC EQUATIONS**

When we solve quadratic equations we find the roots (aka solutions or x-intercepts). To solve a quadratic equation, you MUST equal the expression to 0.

For instance $x^{2}+3x+2 $ is an algebraic expression; however, when you equal this expression to zero it becomes an algebraic equation. $x^{2}+3x+2=0 $is an algebraic equation.

We can solve an algebraic equation in a few ways.

**1) Solving by FACTORING**

Solve $x^{2}+3x+2=0$ by factoring.

**2) THE QUADRATIC FORMULA**

$$x=\frac{-b\pm \sqrt{b^{2}-4ac}}{2a}$$

**Solve** $2x^{2}-7x-4=0 $ using the quadratic formula.

**Sometimes you may not see the zero in the expression. In a case like below, move all the terms to LS.**

**Solve** 2x2 + 3x + 4 = 5 – 2x using the most appropriate method.