Name:_____                    Date:_____

**Goal:** "You will factor trinomials of the form $ax^2 + bx + c$"

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*Remember that when factoring trinomials you are essentially **un-F.O.I.L.ing**

      Recall that when you foil:

    · The **first** term of the final answer is obtained by:

    · The **last** term of the final answer is obtained by:

    · The **second/middle** term of the final answer is obtained by:

$$(d + e)(f + g) = ax^2 + bx + c$$

**Factor each trinomial into the product of two binomials:**

**Ex:** $2x^2 - 7x + 3$                              **Ex:** $3n^2 + 14n - 5$

**Ex:** $3t^2 + 8t + 4$                              **Ex:** $4s^2 - 9s + 5$

**Ex:** $2n^2 + 13n - 7$                              **Ex:** $2x^2 - 13x + 6$

**Factor:**

**Ex:** $-4x^2 + 12x + 7$

**Ex:** $-2y^2 - 5y - 3$

**Ex:** $-5m^2 + 6m - 1$

**Ex:** $-3x^2 - x + 2$

**Ex:** $-3x^2 - 13x - 4$

**Ex:** An athlete throws a discus from an initial height of 6 feet and with an initial vertical velocity of 46 ft/s.

    a. Write an equation that gives the height of the discuss as a function of time (in seconds) since it left the athlete's hand.

    b. After how many seconds does it hit the ground?

**Ex:** A soccer goalie throws the ball into the air with an initial vertical velocity of 28 ft/s, from an initial height of 8 feet.

    a.  Write an equation that gives the height of the soccer ball as a function of time.

    b.  How long does it take for the ball to reach the ground?

**Ex:** A rectangle's length is 13 meters more than 3 times its width. The area is 10 square meters. What is the width?

**Ex:** A rectangles length is 5 feet more than 4 times the width. The area is 6 square feet. What is the width?

**Factoring $ax^2 + bx + c$ FORMULA:** **You still must check your answer by FOILing…even if using the steps below.**

**Ex:** Factor $2x^2 - 7x + 3$ using the following steps:

**1.** Multiply _____ *and* _____                    $a =$          $c =$

                                                       $a \cdot c =$

**2.** Find the factors of ___$x$___ whose sum is _____       Find the factors of _____ that add up to _____

                                                       $m =$ _____, $n =$ _____

**3.** Call these factors $m$ and $n$ and plug into the formula: $ax^2 + mx + nx + c$

 

                                            $2x^2 + -6x + -1x + 3$

**4.** Separate into two binomials
**Not changing the value, just creating two groups         $(2x^2 + -6x) + (-1x + 3)$

 

**5.** Find the GCF in each set of parenthesis **<u>separately</u>.** You want the leftover binomial (the stuff in parenthesis) to match.

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

**6.** The matching binomial is a **<u>common factor</u>** so factor it out, just like you would a **<u>GCF</u>.**

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

**7.** Check your answer by FOILing.

**Factor the following examples using the formula:**

**Ex:** $3x^2 + 10x + 3$                                 **Ex:** $2x^2 + 5x - 63$

**Ex:** $2x^2 - 7x + 3$                                  **Ex:** $3x^2 - 17x + 10$

**Ex:** $4x^2 + 16x + 15$                               **Ex:** $8x^2 - 2x - 3$