Factoring a Trinomial of the form $ax^2 + bx + c$, $a = 1$

I. The **standard form** for a **quadratic** polynomial is $ax^2 + bx + c$, where $a$, $b$, and $c$ are real numbers. It is a degree 2 trinomial.

II. Factoring trinomials of the form $ax^2 + bx + c$, where $a = 1$

   If $a = 1$, the poly looks like: $x^2 + bx + c$

A. Recall: $(x+5)(x+6) =$

B. That generalizes as: $x^2 + bx + c = (x \quad )(x \quad )$

   If no such numbers exist, we say the poly is ________________.

Examples: Factor.

1) $x^2 + 8x + 12$  
2) $y^2 + 5y − 24$

3) $r^2 − 14r + 24$  
4) $13x + x^2 + 40$

5) $u^2 − u − 20$  
6) $x^2 − 4x − 24$

7) $w^2 − 12w + 36$  
8) $x^2 − 7x − 30$
C. What do we notice about the signs of the factors? This will help in section 7.4.

D. Factor **completely**. (This is your hint to first look for a GCF.)

1) $3y^2 - 33y + 54$

2) $2x^3 + 28x^2 - 64x$

3) $2w^2 - 12w - 32$

4) $x^3 + 8x^2 - 48x$