Factor Trinomials of the Form $ax^2 + bx + c$, $a = 1$ by Trial and Error

1. Factor out any common factor(s).
2. Write all pairs of factors of $a$.
3. Write all pairs of factors of the constant $c$.
4. Try various combinations of these factors until $b$ is found.

**Example 1** Factor completely using the trial and error method. If prime, so state.

a. $2x^2 + x - 10$

b. $12x^2 + 23x + 5$

c. $10n^2 - 9n - 8$

d. $7x^2 - 27x - 4$

e. $6m^2 - 17m - 45$

f. $35x^2 + 29xy + 6y^2$

g. $5x^2 + 20x + 12$

h. $12p^3 + 14p^2 - 10p$
Factor Trinomials of the Form $ax^2 + bx + c$, $a = 1$ by Grouping

1. Factor out any common factor(s).
2. Multiply $ac$; find two numbers whose product is $ac$ and whose sum is $b$.
3. Rewrite the middle term $bx$ as the sum or difference of two terms using the numbers found in step 2.
4. Factor by grouping.

Example 2
a. $18x^2 + 45x + 28$

b. $6x^2 + 3x + 10$

c. $4n^2 - 31n - 8$

d. $24x^2 - 17x - 20$

e. $60m^2 + 43m - 10$

f. $24x^3 + 14x^2y - 24xy^2$

g. $6d^2 + 34d - 12$

h. $6h^2 - 5h - 56$