

Factoring by Grouping

→ use for 4 terms

→ use when x^2 has a coefficient.

① group pairs together by common factors.

① $12a^2 + 21a + 8a + 14$
- 12 & 21 have common factors.
- 8 & 14 have common factors.
 $(12a^2 + 21a) + (8a + 14)$

② Factor each set, Circle common factors. →

$12a^2 = 3 \cdot 2 \cdot 2 \cdot a \cdot a$ (leftovers) = 4a
 $21a = 3 \cdot 7 \cdot a$ = 7
GCF = 3a
 $8a = 2 \cdot 2 \cdot 2 \cdot a$ = 4a
 $14 = 2 \cdot 7$ = 7
GCF = 2

③ Rewrite your equation with the GCF on outside of each set of parentheses. →

$3a(4a + 7) + 2(4a + 7)$

↓
Circled factors "leftover" factors

④ Rewrite your equation by ... →

① grouping together the terms outside the parentheses.

② rewriting the other set of terms - ONCE.

③ don't include an addition sign between the sets.

$(3a + 2)(4a + 7)$