Factoring Polynomials

1. GCF

- Numbers
- Variables
- Expressions
  e.g. (x + 2) if it's in all terms

2. How many terms?

- ✓ 2 terms - exponents
  - squares (2, 4, 8, 10)
  - cubes (3, 9, 15)
  (for 6, 12 try as squares first, then as cubes)
- ✓ 3 terms
- ✓ 4 terms

3-terms: $Ax^2 + Bx + C$

Multiply A * C

If positive, add factors.
If negative, subtract factors

** Rewrite as **4-terms**

4-terms:

1. Group first 2 terms
   - Factor GCF
2. Group next 2 terms
   - Factor GCF
   (watch signs!)
3. Bring common expression forward

2-terms:

- squares (even)
  *must be subtract
  - square root each
  (A + B) (A – B)
- cubes (3, 9, 15)
  - cube root each

(A s B)(A^2 o AB ap B^2)
SOAP – same, opposite, always plus

What if A*C is huge?

1. Did you miss a GCF?
2. Are A & C both perfect squares? (use sign of B)
   (A+B)(A+B) or (A-B)(A-B)
3. If B is small, try factors around AC's square root
4. If B is large, "ballpark"
   - the smaller the first factor, the larger the sum/difference
   - start with A and C. move to larger or smaller first factor as needed.

Factor completely!