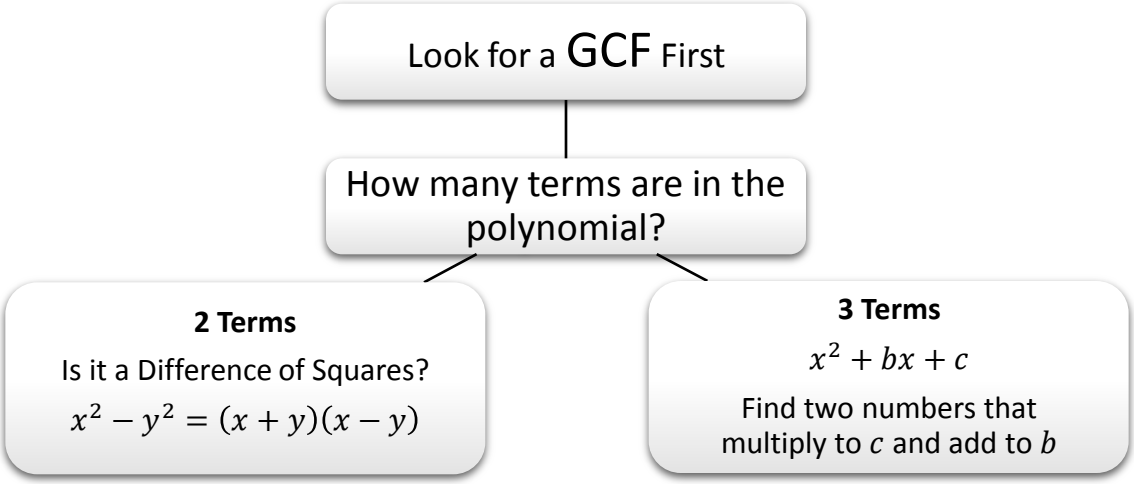
Factoring a Polynomial in One Step Using either GCF, Difference of Squares or Trinomial Factoring in the form $x^2 + bx + c$



Example One

Factor $x^2 - x - 56$

- ✧ Look for a GCF FIRST. Does the polynomial have a GCF? **No**
- ✧ How many terms does the polynomial have? **3 terms**
- ✧ Use trinomial factoring. Find two numbers that multiply to -56 and add to -1. The numbers are -8 and 7.

Answer: $(x - 8)(x + 7)$

Example Two

Factor $9x^2 - 18x$

- ✧ Look for a GCF FIRST. Does the polynomial have a GCF? **Yes**
- ✧ Determine the GCF and factor it out. The GCF is $9x$.

Answer: $9x(x - 2)$

Example Three

Factor $4x^2 - 81$

- ✧ Look for a GCF FIRST. Does the polynomial have a GCF? **No**
- ✧ How many terms does the polynomial have? **2 terms**
- ✧ Is it a difference of squares? **Yes**

Answer: $(2x + 9)(2x - 9)$

Factor the following.

1. $x^2 - 9$
2. $144x^4 - y^2$
3. $x^2 + 4x - 12$
4. $x^2 + 9x + 8$
5. $x^2 - 81y^2$
6. $x^2 - 17x + 72$
7. $-28x^3y^2 + 7x^2y^2 - 35x^2y^3$
8. $6x^2 + 24x$
9. $x^2 - 5xy - 36y^2$
10. $24x^4 - 8x^3$
11. $16 - 25x^2$
12. $15x^4y - 10x^3y + 5x^2y$
13. $x^2 + 6x + 9$
14. $x^2 - 11xy + 30y^2$
15. $49 - x^2$
16. $12x^3 + 144x^2 - 36x$
17. $x^2 - 8x - 84$
18. $169x^2 - 16y^2$
19. $x^2y^2 - x^3y^3$
20. $x^2 - 12x + 36$