Secondary Math III
The Factor Theorem
Assignment 4.3

Name: _____
Period: ____

Use synthetic division to determine if $g(x)$ ***is a factor of*** $f(x)$***. If it is, write*** $f(x)=(x-a)q(x)$***, where*** $q(x)$ ***is the quotient and*** $(x-a)$ ***is*** $g(x)$**.**

1. $f(x)=x^3+5x^2-x-5$; $g(x)=(x-5)$

2. $f(x)=4x^4-x^3-52x^2-35x+12$; $g(x)=(x-3)$

3. $f(x)=x^3-12x^2+x-12$; $g(x)=(x-12)$

4. $f(x)=3x^3+13x^2+18x+8$; $g(x)=(3x+4)$

Use the Factor Theorem to determine whether $g(x)$ ***is the factored form of*** $f(x)$**.**

5. $g(x)=(x+8)(x-1)(x+2)$
   $f(x)=x^3-7x^2-10x+16$

6. $g(x)=(x-3)(x+5)(x+2)(x-1)$
   $f(x)=x^4+3x^3-15x^2-19x+30$

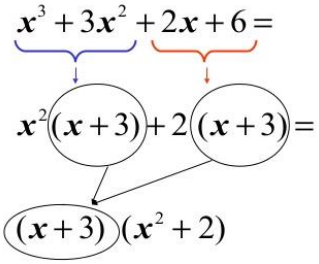
7. $g(x)=(x-2)(x+9)(x+1)$
   $f(x)=x^3+8x^2-11x-18$

8. $g(x)=(x+1)(x-2)(4x+7)$
   $f(x)=4x^3-11x^2-x+14$

9. Find *k* (the unknown coefficient) if (*x* + 1) is a factor of $f(x) = x^4 + 2x^3 - 6x^2 + kx - 7$

HINT: Look at number 3 on notes today☺

10. Find *k* if (*x* – 3) is a factor of $f(x) = x^4 + kx^3 + 14x^2 - 30x + 45$



Factor completely. Remember to take the GCF first.
Differernce of Squares: $(a^2 - b^2) = (a+b)(a-b)$
Factor By Grouping: Look at example at right

11. $49x^2 - 4y^2$

12. $x^3 - x$

13. $2x^3 - 32x$

14. $x^2 - 15x + 56$

15. $x^2 - 13x + 36$

16. $x^4 - 7x^2 + 6$

17. $x^4 - 50x^2 + 49$

18. $x^3 - 3x^2 + x - 3$

19. $x^3 + x^2 - 4x - 4$

20. $x^4 - y^4$