Factoring GCF – A=1 – A not 1 – Difference of Squares Notes/Homework

Name_____ Date_____

Factor out GCF Greatest Common Factor

Factors

15: 1, 3, 5, 15

35: 1, 5, 7, 35

$15x + 35$

$5\cdot3\cdot x + 5\cdot7$

$5(3x+7)$

common factor • (leftover factors)

$-5 - 1x$

$-1\cdot5 - 1\cdot x$

$-1(5+x)$

$-1(x+5)$

★ factoring out -1 changes sign

$14 - 7x$

$-7(-2+x)$

$-7(x-2)$

$55p^2 - 11p^4 + 44p^5$

$11\cdot5\cdot p\cdot p - 11\cdot p\cdot p\cdot p\cdot p + 11\cdot4\cdot p\cdot p\cdot p\cdot p\cdot p$

$11p^2(5 - p^2 + 4p^3)$

$11p^2(4p^3 - p^2 + 5)$

$14x^3 - 42x^5 - 49x^4$

$7x^3(2 - 6x^2 - 7x)$

$-7x^3(6x^2 + 7x - 2)$

$30mn^2 + m^2n - 6n$

$n(30m + m^2 - 6)$

$n(m^2 + 30m - 6)$

$3x^2 - 4x = 0$

$x(3x-4)=0$

$x=0$ $\quad 3x-4=0$

$3x=4$

$x=\frac{3}{4}$

$27x^3 - 108x = 0$

$27x(x^2-4)=0$

$x=0$

$x^2-4=0$

$+4 \quad +4$

$\sqrt{x^2}=\sqrt{4}$

$x=\pm2$

$x=2$

$x=-2$

when you take the $\sqrt{}$ must be $\pm$

$45s^3 - 18s^2 = 0$

$9s^2(5s-2)=0$

$s^2=0 \quad 5s-2=0$

$s=\pm0 \quad 5s=2$

$s=0$ twice $\quad s=\frac{2}{5}$

1) Pair up terms

2) Factor out GCF from each term

3) Factor out common factor again

Factor by Grouping

$12ax + 3xz + 4ay + 1yz$

$3x(4a+1z) + 1y(4a+1z)$

$(4a+z)(3x+y)$

$4m^2 + 4mn + 3mn + 3n^2$

$4m(m+n) + 3n(m+n)$

$(m+n)(4m+3n)$

$14y^3 - 28y^2 + 3y + 6$

$14y^2(1y-2) + 3(1y+2)$

Not factorable by grouping

$\rightarrow 14y^3 - 28y^2 - 3y + 6$

$14y^2(y-2) - 3(y-2)$

$(y-2)(14y^2-3)$

$6y^2 - 4y - 3y + 2 = 0$

$2y(3y-2) - 1(3y-2) = 0$

$(3y-2)(2y-1)=0$

$3y-2=0 \quad 2y-1=0$

$+2 \quad +2 \quad +1 \quad +1$

$\frac{3y}{3}=\frac{2}{3} \quad \frac{2y}{2}=\frac{1}{2}$

$y=\frac{2}{3} \quad y=\frac{1}{2}$

$12a^3 - 3a^2 + 8a = 2$

$-2 \quad -2$

★ must = 0 in order to factor

$12a^3 - 3a^2 + 8a - 2 = 0$

$3a^2(4a-1) + 2(4a-1) = 0$

$(4a-1)(3a^2+2)=0$

$4a-1=0 \quad 3a^2+2=0$

$4a=1 \quad 3a^2=-2$

$a=\frac{1}{4} \quad \sqrt{a^2}=\sqrt{-\frac{2}{3}}$

$a=\pm i\sqrt{\frac{2}{3}}$

★ Imaginary solutions

★ if there is a negative under the $\sqrt{}$, take out an i and make underneath positive