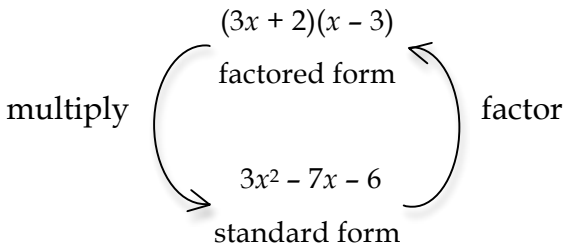
Algebra 1: 12.3 Guided Notes **Name** _____ **Period** _____

Factoring Polynomials of the Form ax^2+bx+c



where $a \neq 1$

Factor Trinomials of the Form ax^2+bx+c

Slip and Slide Method:

1) *Factor out the GCF, if possible.*
2) *If $a \neq 1$, then "slip" it to the back of the polynomial and multiply a by c.*
3) *Factor the new trinomial*
4) *Divide both factors by a.*
5) *Reduce the fractions and "slide" the denominators in front of the variables.*

Factor each polynomial.

1. $3x^2+7x+2$

No GCF.

$x^2+7x+6 \quad (=3\cdot 2)$ "slip"

Factors Pairs of 6

$1\cdot 6$

$2\cdot 3$

Sum = 7 (b)

$1+6=7$ ✓

$x^2+7x+6=(x+1)(x+6)$

$\left(x+\frac{1}{3}\right)\left(x+\frac{6}{3}\right)$ $\frac{6}{3}=2$

$(3x+1)(x+2)$ "slide"

2. $3x^2+14x+8$ *All terms are positive!*

No GCF.

$x^2+14x+24 \quad (=3\cdot 8)$

Factors Pairs of 24

$1\cdot 24$

$2\cdot 12$

$3\cdot 8$

$4\cdot 6$

Sum = 14 (b)

$2+12=14$ ✓

$x^2+14x+24=(x+2)(x+12)$

$\left(x+\frac{2}{3}\right)\left(x+\frac{12}{3}\right)$ $\frac{12}{3}=4$

$(3x+2)(x+4)$

3. $5m^2-17m+6$ *The middle term is negative!*

No GCF.

$m^2-17m+30 \quad (=5\cdot 6)$

Factors Pairs of 30

$-1\cdot(-30)$

$-2\cdot(-15)$

$-3\cdot(-10)$

$-5\cdot(-6)$

Sum = -17 (b)

$-2+(-15)=-17$ ✓

$m^2-17m+30=(m-2)(m-15)$

$\left(m-\frac{2}{5}\right)\left(m-\frac{15}{5}\right) \qquad -\frac{15}{5}=-3$

$(5m-2)(m-3)$

4. $6y^2-5y-4$ *The middle & last terms are negative!*

No GCF.

$y^2-5y-24 \quad (=6\cdot(-4))$

Factors Pairs of -24

$1\cdot(-24)$ or $-1\cdot 24$

$2\cdot(-12)$ or $-2\cdot 12$

$3\cdot(-8)$ or $-3\cdot 8$

$4\cdot(-6)$ or $-4\cdot 6$

Sum = -5 (b)

$3+(-8)=-5$ ✓

$y^2-5y-24=(y+3)(y-8)$

$\left(y+\frac{3}{6}\right)\left(y-\frac{8}{6}\right) \qquad \frac{3}{6}=\frac{1}{2}$ and $-\frac{8}{6}=-\frac{4}{3}$

$(2y+1)(3y-4)$

5. $6t^2+4t-2$ *The last term is negative!*

GCF = 2

$\frac{6t^2}{2}+\frac{4t}{2}-\frac{2}{2}=3t^2+2t-1$

$2(3t^2+2t-1)$

$3t^2+2t-1 \rightarrow t^2+2t-3 \quad (=3\cdot(-1))$

Factors Pairs of -3

$1\cdot(-3)$ or $-1\cdot 3$

Sum = 2 (b)

$-1+3=2$ ✓

$t^2+2t-3=(t-1)(t+3)$

$\left(t-\frac{1}{3}\right)\left(t+\frac{3}{3}\right)$

$(3t-1)(t+1)$

$6t^2+4t-2=2(3t-1)(t+1)$ *Don't forget the GCF!*