5.2 Factoring Trinomials/Solving by Factoring

Keys to successful factoring:

- Arrange trinomial in descending/ascending degree
- Factor out the greatest common factor to reduce the size of the exponents or coefficients, or to eliminate fractions
- Check your factoring with multiplication

$2\left(\frac{3}{2}-20\right)$

Factor completely:

ex. 1 $-3x^2+36x+84$

$-3(x^2-12x-28)$

$-3(x+2)(x-14)$

ex. 2 $x^{2n}-12x^n+27$

$x^{2n}=(x^n)^2$ $(x^n-9)(x^n-3)$

ex 3 $(x-4)^2-5(x-4)-150$

$((x-4)-15)((x-4)+10)$

$(x-19)(x+6)$

ex. 4 $2x^2+11x+15$

$(2x+5)(x+3)$

ex. 5 $3x^3-10x^2-8x$

$=x(3x^2-10x-8)$

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

ex. 6 $4x^2 - 27x + 18$

prod $72x^2$

sum $-27x$

$-3x, -24x$

$(x - 6)(4x - 3)$

$-24x$

$-3x$

ex. 7 $6x^2 - 17x - 10$

$-60x^2$

prod

sum

$-17x$

$-20x, 3x$

$(3x - 10)(2x + 1)$

Zero Product Property: If ab = 0, then a = 0 or b = 0.

ex. 8 Solve for *x*.

$30x^3 = 57x^2 - 21x$

$30x^3 - 57x^2 + 21x = 0$

$3x(10x^2 - 19x + 7) = 0$

$3x(5x - 7)(2x - 1) = 0$

$3x = 0$ OR $5x - 7 = 0$ OR $2x - 1 = 0$

$x = 0, \frac{7}{5}, \frac{1}{2}$