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

Factor completely:

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

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

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

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

$x^n \cdot x^n$

$(x^n - 9)(x^n - 3)$

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

$a^2 - 5a - 150$

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

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

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

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

$5x$, $10x$

prod = 72, sum = 11, $10+1$

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

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

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

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

$4 \cdot 1$, $2 \cdot 2$

$2 \cdot 9$, $3 \cdot 6$, $18 \cdot 1$

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

$-3x$, $-24x$

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

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

$0 + 1 = -17x$ $\quad -20x + 3x$

$\text{prod} = -60x^2$

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 $2x - 1 = 0$

$x = 0,\ 7/5,\ 1/2$