Difference of Squares and Solving by Factoring

MATH@TD

Special Cases:
A. Differences of Squares

Let's look at expanding first:

$(5n-3)(5n+3)$

$=25n^2+15n-15n-9$

$=25n^2-9$

$(7x-4)(7x+4)$

$=49x^2+28x-28x-16$

$=49x^2-16$

In the examples above, try figuring out how to work backwards from the last step to the first step.

Difference of Squares– the polynomial must be a binomial
- the 1st and 2nd terms must be perfect squares
- there must be a minus sign between the two terms

$49n^2-4$

$=(7n-2)(7n+2)$

$75n^4-27$

$=$

x^2-25

$=(x-5)(x+5)$

$=x^2+5x-5x-25$

$=x^2-25$

Solve by Factoring:

- **Follow the steps of factoring**
  1. **Is there a greatest common factor?**
  2. **What two numbers multiply to the last term and add to the middle term?**
  3. **Set up (x +/- ___) (x+/- ___) and plug in your factors you found in step 2.**

- **To SOLVE by factoring:**
  - **First, make sure the expression is all on the same side of the equal side**
  - **After you factor, you need to find a "solution set" (or s.s for short) by solving for the variable in each set of brackets (hint* make each one equal 0, then solve for x)**

1. $n^2+7n=8$

$n^2+7n-8=0$

$(n-1)(n+8)=0$

$n-1=0$ $+1$ $+1$

$n=1$

$n+8=0$ -8 -8

$n=-8$

s.s. $\{1,-8\}$

-8 8

$\times$ -8

$+$ 7

$-1, 8$

$2, 4$

2. $k^2=-6k+16$

$k^2+6k-16=0$

$(k-2)(k+8)=0$

$k-2=0$

$k=2$

$k+8=0$

$k=-8$

s.s. $\{2,-8\}$

$\times$ -16

$+$ 6

$-2, 8$

$4, 4$