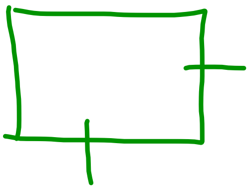
Lesson 2.5 Special Cases

* looking for shortcuts
* Saves time and usually it is easier

Perfect Square (Case 1)

Eg. Find the area of a square that has a side length of $2x + 3$.



$2x+3$

(s = side length)

$$A = s^2$$

$$= (2x+3)^2$$

$$= 4x^2 + 12x + 9$$

square the first
Double the product
square the last

Now, lets work backwards!

* look for perfect squares on first and last terms!

Factor 1) $4x^2 + 12x + 9$

$$= (2x+3)^2$$

Do the opposite of squaring!

$\sqrt{4x^2} = 2x$ ∴ squareroot 1st & last term

$\sqrt{9} = 3$

* sign of middle term

2) Factor $16x^2 - 8x + 1$

$$= (4x-1)^2$$

$\sqrt{16x^2} = 4x$

$\sqrt{1} = 1$

* sign of middle term

Difference of Squares (case 2)

*look for a binomial with a subtract sign in between two perfect squares.

$$\boxed{a^2 - b^2 = (a + b)(a - b)}$$

Factor.

Eg.1) $4x^2 - 9$

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

You need to set up 2 sets of brackets, one positive, and one negative!

Now take the square root of the first and last term!

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

$= 4x^2 - \cancel{6x} + \cancel{6x} - 9$

$= 4x^2 - 9$

* Note Middle terms must cancel!

Eg. 2) $121y^4 - 25z^{10}$

$= (11y^2 + 5z^5)(11y^2 - 5z^5)$

*3) $16x^4 - 1$ $= (4x^2 + 1)(4x^2 - 1)$ keep going

$= (4x^2 + 1)(2x + 1)(2x - 1)$

HW Pg 115 # 3 -7, *9, 11, *12