When expanding factors that look like this: $(a + b)(a - b)$

Conjugates

$(a + b)(a - b) = \quad a^2 - b^2$

Why is the sign always a minus?

because you are multiplying two numbers with opposite signs.

Take a white board.

$(H - 12)(H + 12) =$

$H^2 - 144$

$(2K + 7)(2K - 7)$

$4K^2 - 49$

$(3c^2 + 4d^3)(3c^2 - 4d^3) =$

$9c^4 - 16d^6$

Perfect Squares

$$(\text{any Integer})^2 = \text{perfect square}$$

$$\sqrt{\text{perfect square}} = \text{Integer}$$

Is 441 a perfect square? $\sqrt{441} = 21$ yes

Is 525 a perfect square? $\sqrt{525} = 22.91$ NO

Perfect Squares:

1
4
9
16
25
36
49
64
81
100
121
144
169

The Difference of Perfect Squares

$$a^2 - 16$$

Is each of the below the Difference of Perfect Squares?

1. $K^2 - 100$ Yes
2. $G^2 - 225$ Yes
3. $M^2 + 36$ NO
4. $Y^6 - 9$ Yes
5. $H^9 - 4$ NO
6. $25A^2 - 144$ Yes
7. $100W^2 - 49Z^4$ Yes

To be considered the Difference of Perfect Squares:

- Coefficients and constants must be perfect squares.
- Exponents must be even.

Expand:

$(x - 4)(x + 4) = x^2 - 16$

Factor

$(b-10)(b+10) = b^2 - 100$

Factor each.

$Q^2 - 25 = (q+5)(q-5)$

$C^2 - 64 = (c-8)(c+8)$

$w^2 - 324 = (w+18)(w-18)$

$4A^2 - 81 = (2A+9)(2A\ 9)$

$M^2 - 49N^2 = (\quad)(\quad)$

$289c^8 - 441k^{18}$

$(17c^4 + 21k^9)(17c^4 - 21k^9)$

Is this the Difference of Perfect Squares?

$$5c^2 - 45$$

Factor out the GCF and notice what you get

$$5(c^2 - 9) = 5(c+3)(c-3)$$

$$5(c + 3)(c - 3)$$

This is called "Factored Completely"

Factor each COMPLETELY: GCF

1. $6a^2 - 150$

   $6(a^2-25)$

   $6(a+5)(a-5)$

2. $3x^3 - 48x$

   $3x(x^2-16)$

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

3. $28m^2 - 63$

   $7(4m^2-9) = 7(2m+3)(2m-3)$

4. $32c^5 - 98c^3$

Hwk #29:

Sec 9-7

Pages 493-494

Problems 14, 15, 22, 23, 31, 32, 60