The Difference of Perfect Squares

$$a^2 - b^2$$

A binomial that has this form always factors into the following:

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

$$a^2 - b^2 = (\sqrt{1^{st}\text{ term}} + \sqrt{2^{nd}\text{ term}})(\sqrt{1^{st}\text{ term}} - \sqrt{2^{nd}\text{ term}})$$

To be considered the Difference of Perfect Squares:

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

Factor each.

$M^2 - 121 = (m - 11)(m + 11)$

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

$K^2 - 625 = (K-25)(K+25)$

$9B^2 - 49 = (3b-7)(3b+7)$

$25M^6 - 36N^{10} = (5m^3+6n^5)(5m^3-6n^5)$

Is this the Difference of Perfect Squares?

$5c^2 - 45$

It doesn't appear to be because 5 and 45 aren't perfect squares.

Factor out the GCF and notice what you get

$5(c^2 - 9)$

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

This is called "Factored Completely"

Steps when factoring:

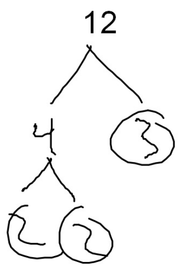
Step 1: Take out GCF, if there is one

Step 2: After taking out GCF, see if what is in parentheses can be factored further.

Do the Prime Factorization of 10

$10 = 2 \cdot 5$

Do the Prime Factorization of 12



$12 = 2 \cdot 2 \cdot 3$

Sometimes factoring takes multiple steps.

Factor each COMPLETELY: Factor using GCF First

1. $2c^2 - 72$

   $2(c^2 - 36)$

   $2(c-6)(c+6)$

2. $m^3 - 25m$

   $m(m^2 - 25)$

   $m(m+5)(m-5)$

3. $12g^3 - 48g$

   $12g(g^2-4) \rightarrow 12g(g+2)(g-2)$

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

   $2c^3(16c^2 - 49)$

   $2c^3(4c+7)(4c-7)$

Factor Completely

$43e^{10} - 43f^{10}$

$43(e^{10} - f^{10})$

$43(e^5 + f^5)(e^5 - f^5)$

$\frac{1}{9}a^2 - \frac{1}{25}$

$(\frac{1}{3}a + \frac{1}{5})(\frac{1}{3}a - \frac{1}{5})$

Hwk #29:

Sec 9-7

Pages 493-494

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