1.4 Factoring Polynomials

- Factoring Out the Greatest Common Factor
- Factoring by Grouping
- Factoring Trinomials
- Factoring Binomials
- Factoring by Substitution.

Example 1 : Factoring Out the Greatest Common Factor

$$ab + ac = a(b + c), GCF = a$$

Factor out the greatest common factor from each polynomial GCF.

a) $9y^5 + y^2$

b) $6x^2t + 8xt + 12t$

c) $14(m + 1)^3 - 28(m + 1)^2 - 7(m + 1)$

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The greatest common factor (GCF) of $28r^4s^2 + 7r^3s - 35r^4s^3$ is :

A. $7r^3s$

B. r^3

C. rs

D. r^3s

<u>Homework 1</u> : Factoring by Grouping

Factor each polynomial by grouping.

a) $mp^2 + 7m + 3p^2 + 21$

b) $2y^2 + az - 2z - ay^2$

c) $4x^3 + 2x^2 - 2x - 1$

Factoring Trinomials

Example 1 :   Factoring Trinomials - **Factor each trinomials.**

a) $y^2 - 5y + 6$

b) $p^2 - 4p - 5$

c) $x^2 - 6x + 9$

<u>Example 2 :</u> Factoring Trinomials

Factor each trinomials.

a)$4y^2 - 11y + 6$

$b)\ 6p^2 - 7p - 5$

c) $16y^3 + 24y^2 - 16y$

Factoring Perfect square Trinomials

$$x^2 + 2xy + y^2 = (x + y)^2$$

$$x^2 - 2xy + y^2 = (x - y)^2$$

Homework 2:

$$a) 16p^2 - 40pq + 25q^2$$

$$b) 36x^2y^2 + 84xy + 49$$

Factoring Binomials

Difference of Squares $\qquad x^2 - y^2 = (x + y)(x - y)$

Difference of Cubes $\qquad x^3 - y^3 = (x - y)(x^2 + xy + y^2)$

Sum of Cubes $\qquad\qquad x^3 + y^3 = (x + y)(x^2 - xy + y^2)$

Homework 3: Factoring Sums or Difference of Cubes

Factor each polynomial.

a) $x^3 + 27$

b) $m^3 - 64n^3$

c) $8q^6 + 125p^9$

Example 3: Factoring Difference of Squares.

a) $4m^2 - 9$

b) $256k^4 - 625m^4$

c) $(a + 2b)^2 - 4c^2$

d) $x^2 - 6x + 9 - y^4$

e) $y^2 - x^2 + 6x - 9$

Factoring by Substitution

<u>EXAMPLE 4:</u> **Factoring by Substitution :**

Factor each polynomial.

a) $10(2a-1)^2 - 19(2a-1) - 15$

b) $(2a-1)^3 + 8$

c) $6z^4 - 13z^2 - 5$