**2.3 – Factoring Polynomials**

To factor polynomials fully, you can use factoring strategies that include:

1. Common Factoring

Common factoring is a strategy in which the factors of each term are examined and the GCF (Greatest Common Factor) is removed from each of the terms and placed outside of the brackets.

**Example One**

Factor the following expressions by removing the GCF.

1. 4x2 - 80x + 36x3 b) 3ab2 + 24a2b3 + 6ab
2. Difference of Squares

A difference of squares is a situation in which two terms, which are both square numbers, are separated by a subtraction sign. To factor a “difference of squares” use the following logic: a2 – b2 = (a + b)(a – b).

**Example Two**

Factor.

1. x2 – 4 b) 4x2 – 9y2

1. Factorable trinomial of the form ax2 + bx + c, where a = 1. You ask yourself, “What do I multiply to get *c* and add to get *b*?”

**Example Three**

Factor. x2 – x – 30

1. Factorable trinomial of the form ax2 + bx + c, where a ≠ 1. You ask yourself, “What do I multiply to get *ac* and add to get *b*?”

**Example Four**

Factor.

1. 10x2 – x – 3 b) x4 + 4x2 - 32
2. Perfect Square. A trinomial where the first and last terms are perfect squares. Can be in the form a2 + 2ab + b2 = (a + b)2 or a2 – 2ab + b2 = (a – b)2.

**Example Five**

Factor. 9x2 + 30x + 25

If a polynomial has more than three terms, you may be able to factor it by grouping. This is only possible if the grouping of terms allows you to divide out the same common factor from each group.

1. Grouping. Separate expression into groups and GCF each group.

**Example Six**

Factor.

1. n3 + 3n2 + 2n + 6 b) x2 – 6x + 9 – 4y2