There are several patterns of FACTORING that you should start to memorize, or at least recognize.

**The first thing** you should always look for is the Greatest Common Factor (GCF).

Here are some examples:

3x2 + 9x ; both terms have at least a ‘3’ and an ‘x’ in them, so factor that out → (3x)(x+3)

X3-x2-6x ; all three terms have ’x’ in them, so factor that out → (x) (x2-x-6)

9a3b3 +15a2b2+6ab ; all three terms have 3ab as a common factor, so factor it out → (3ab)(3a2b2+5ab+2)

**Next** you should look for factor patterns. Here are the most common:

**Difference of Perfect Squares:** There will only be two terms subtracted from each other, both will be a perfect square. Examples:

**X2 – 4** this factors to two similar binomials with the only difference being that one is positive and the other is negative. Take the square root of each term to get → (x+2)(x-2)

**16x2 – 25** Take the square root of each term to get → (4x + 5) (4x - 5)

The square root of 16 is ‘4,’ The square root of x2 is ‘x’ The square root of 25 is ‘5’

**a2 – b2** Take the square root of each term to get → (a + b) (a - b)

The square root of a2 is ‘a,’ The square root of b2 is ‘b’

**Perfect Square Trinomial:** There will be two terms, the first term and last term, both will be a perfect square. Examples:

**X2 + 4X + 4** Take the square root of the first term and the last term to get → (x+2)(x+2) which is the same as (x+2)2

**9x2+24x+16** Take the square root of the first term and the last term to get → (3x+4)(3x+4) which is the same as (3x+4)2

**X2 – 10x + 25** Take the square root of the first term and the last term to get → (x-5)(x-5) which is the same as (x-5)2

Factor these problems. Look for GCF then a pattern.

A.) 18x2+48x+32 B.) 5x3-20x2

(2)(9x+24x+16) = (2)(3x+4)(3x+4) (5x)(x2-4) =

= (2)(3x+4)2 = (5x)(x+2)(x-2)