Factoring using Distributive Property and GCF

Recall that the distributive property states that ab+ac=a(b+c). The distributive property allows you to factor out the GCF of the terms of a polynomial to write a factored form of the polynomial.

A polynomial is in its factored form when it is written as a product of monomials and polynomials that cannot be factored further.

As you now you can write any number bigger than one as a product of prime factors. For example
$10 = 2 \bullet 5$ $12 = 2 \bullet 2 \bullet 3$ $15 = 3 \bullet 5$

Notes: To find GCF of 2 numbers a and b

1) If a is multiple of b, then the GCF is b.
For example 10 is a multiple of 5, so the GCF is 5, and30 is a multiple of15, so the GCF is 15.

2) If a and b are relatively prime numbers (no common factor other than 1), the GCF is 1.
For example 7 and 8 are relatively prime numbers, so the GCF is 1. 11 and 15 are relatively prime numbers, so the GCF is 1.

Rule: To find GCF of the variables of monomials, take the least common power of each variable. For example the GCF of $x^2 \,\&\, x^5$ is x^2. The GCF of $xy^2 \,\&\, x^4y^3$ is xy^2

Example 1: Find the GCF of the following monomials.
1) $xy^3 \quad \& \quad x^2y^5$ GCF= xy^3 2) $4a^3b^3 \quad \& \quad 20a^2b^4$ GCF= $4a^2b^3$ 3) $4a^2b^4c^2 \quad \& \quad 5a^2b^3c^5$ GCF= $a^2b^3c^2$ 4) $25ab^2c^3 \quad \& \quad 25a^2b^3$ GCF= $25ab^2$

Take a look at the following.

Multiplying using distributive property	Factoring using distributive property
$m(k-l) = mk - ml$	$mk - ml = m(k-l)$
$2(x+3) = 2x+6$	$2x+6 = 2(x+3)$