## Partial Fractions of Improper Rational Functions.

If degree of f(x) is greater than or equal to degree of g(x), then  $\frac{f(x)}{g(x)}$  is called an improper

rational function and every rational function can be transformed to a proper rational function by dividing the numerator by the denominator.

We divide the numerator by denominator until a remainder is obtained which is of lower degree than the denominator.

i.e., 
$$\frac{f(x)}{g(x)} = Q(x) + \frac{R(x)}{g(x)}$$
, where degree of  $R(x) <$  degree of  $g(x)$ .  
For example,  $\frac{x^3}{x^2 - 5x + 6}$  is an improper rational function and can be expressed as  
 $(x + 5) + \frac{19x - 30}{x^2 - 5x + 6}$  which is the sum of a polynomial  $(x + 5)$  and a proper rational function  
 $\frac{19x - 30}{x^2 - 5x + 6}$ .