Least Common Denominator Encyclopedia Article

Least Common Denominator

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A common denominator for a set of **fractions** is simply the same (common) lower symbol (denominator). In practice the common denominator is chosen to be a number that is divisible by all of the denominators in an **addition** or **subtraction** problem. Thus for the fractions 2/3, 1/10, and 7/15, a common denominator is 30. Other common denominators are 60, 90, etc. The smallest of the common denominators is 30 and so it is called the least common denominator.

Similarly, the algebraic fractions x/2(x+2)(x-3) and 3x/(x+2)(x-1) have the common denominator of 2(x+2)(x-3)(x-1) as well as 4(x+2)(x-3)(x-1)(x^2+4), etc. The polynomial of the least degree and with the smallest numerical coefficient is the least common denominator. Thus 2(x+2)(x-3)(x-1) is the least common denominator.

The most common use of the least common denominator (or L.C.D.) is in the addition of fractions. Thus, for example, to add 2/3, 1/10, and 7/15, we use the L.C.D. of 30 to write

2/3 + 1/10 + 7/15 as 2x10/3x10 + 1x3/10x3 + 7x2/15x2 which gives us 20/30 + 3/30 + 14/30 or 37/30

Similarly, we have

x/2(x+1)(x-3) + 3x/(x+2)(x-1) = x(x-1)/2(x+1)(x-3)(x-1) + 6x(x-3)/2(x+2)(x-1)(x-3)= [x(x-1)+6x(x-3)]/2(x+1)(x-3)(x-1)