

## Web Appendix B - Method for Finding Least Common Multiples

Finding the least common multiple of any set of integers proceeds as follows:

1. Find the prime factors of all the integers.
2. For each prime factor that occurs find the number of occurrences in each of the integers.
3. Form the product of each prime factor that occurs, occurring the maximum number of times that it occurred in the integers.
4. That product is the least common multiple.

Example:

Find the least common multiple of the integers 1 through 10.

1. Find the prime factors:  
 $1 = 1, 2 = 2, 3 = 3, 4 = 2 \times 2, 5 = 5, 6 = 2 \times 3, 7 = 7, 8 = 2 \times 2 \times 2, 9 = 3 \times 3, 10 = 2 \times 5$
2. The maximum number of occurrences of each of the prime factors is summarized below:

Prime Factor	Number of Occurrences
1	1
2	3
3	2
5	1
7	1

3. Therefore the least common multiple is

$$2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 7 = (2)^3 (3)^2 (5) (7) = 2520 .$$

If the numbers are not integers, pre-multiply them by some common factor to make them all integers (if possible), perform the method above and then divide the result by that same factor.

Example: Find the least common multiple of  $2/\pi, 3/2\pi, 5/7\pi$  .

If we premultiply by  $14\pi$ , we get the integers, 28, 21, 10. The prime factors are  $2 \times 2 \times 7, 3 \times 7, 2 \times 5$ . Therefore the least common multiple of 28, 21, 10 is  $2 \times 2 \times 3 \times 5 \times 7 = 420$  and the least common multiple of  $2/\pi, 3/2\pi, 5/7\pi$  is  $420/14\pi = 30/\pi$ . The fact that this is a common multiple can be confirmed by finding the ratios

$$\frac{30/\pi}{2/\pi} = 15, \frac{30/\pi}{3/2\pi} = 20, \frac{30/\pi}{5/7\pi} = 42$$

which are all integers.