

Answer on Question #84495 – Math – Combinatorics | Number Theory

Question

1. What is the difference between L.C.M of all the numbers from 1 to 12 and L.C.M of all the numbers from 1 to 11?

Solution

$$LCM_1 = LCM(1,2,3,4,5,6,7,8,9,10,11,12) = \frac{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot 10 \cdot 11 \cdot 12}{2 \cdot 6 \cdot 4 \cdot 3 \cdot 10 \cdot 12} = 27720$$

$$LCM_2 = LCM(1,2,3,4,5,6,7,8,9,10,11) = \frac{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot 10 \cdot 11}{2 \cdot 6 \cdot 4 \cdot 3 \cdot 10} = 27720$$

Answer: $LCM_1 = LCM_2$.

Question

2. From 1 to 150. How many integers are multiples of 3 or 6 but not of 5?

Solution

The number of multiples of 3 or 6:

$$n_1 = \frac{150}{3} = 50$$

The number of multiples of 3 and 5:

$$n_2 = \frac{150}{3 \cdot 5} = 10,$$

The required number of integers:

$$n = 50 - 10 = 40$$

Answer: $n = 40$.