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Page No.
Date: / /

~~Q2. How many are not divisible by 5 & 7.~~

Q.3. Determine the numbers of integers between 1 and 250 that are divisible by any of the integers 2, 3, 5 & 7.

→ Given sets of number is
1, 2, 3 ... 250.

Let the numbers of integers which are divisible by 2, 3, 5 & 7 be as follows,

$$A = \frac{250}{2} = 125 \quad , \quad B = \frac{250}{3} = 83$$

$$C = \frac{250}{5} = 50 \quad , \quad D = \frac{250}{7} = 35.$$

$$A \cap B \cap C = \frac{250}{2 \times 5 \times 3} = 8$$

$$A \cap B \cap D = \frac{250}{3 \times 2 \times 7} = 5$$

$$A \cap C \cap D = \frac{250}{2 \times 5 \times 7} = 3$$

$$B \cap C \cap D = \frac{250}{3 \times 5 \times 7} = 2$$

$$A \cap B \cap C \cap D = \frac{250}{2 \times 3 \times 5 \times 7} = 1$$

$$A \cap B = \frac{250}{2 \times 3} = 41.$$

$A \cap C = \frac{250}{2 \times 5} = 25.$

$B \cap C = \frac{250}{3 \times 5} = 16.$

$A \cap D = \frac{250}{2 \times 7} = 17.$

$B \cap D = \frac{250}{8 \times 7} = 11$

$C \cap D = \frac{250}{5 \times 7} = 7$

$|A \cup B \cup C \cup D| = |A| + |B| + |C| + |D| - |A \cap B| - |A \cap C| - |A \cap D| - |B \cap C| - |B \cap D| - |C \cap D| + |A \cap B \cap C| + |A \cap B \cap D| + |A \cap C \cap D| + |B \cap C \cap D| - |A \cap B \cap C \cap D|.$

$= 125 + 83 + 50 + 35 - 41 - 25 - 17 - 16 - 11 - 7 + 8 + 5 + 3 + 2 - 1$

$A \cup B \cup C \cup D = 193.$

In given set of numbers between 1, 2, 3, ... 250 there are 193 numbers.