

- What is the probability that an integer in the set  $\{1, 2, 3, \dots, 100\}$  is divisible by 2 and not divisible by 3?

(A)  $\frac{1}{6}$       (B)  $\frac{33}{100}$       (C)  $\frac{17}{50}$       (D)  $\frac{1}{2}$       (E)  $\frac{18}{25}$

**2003 AMC 10 A, Problem #15—**  
**“How many are divisible by both?”**

- **Solution (C)** Of the  $\frac{100}{2} = 50$  integers that are divisible by 2, there are  $\lfloor \frac{100}{6} \rfloor = 16$  that are divisible by both 2 and 3. So there are  $50 - 16 = 34$  that are divisible by 2 and not by 3, and  $34/100 = 17/50$ .

**Difficulty:** Medium

**NCTM Standard:** Number and Operations Standard for Grades 9–12: Use number-theory arguments to justify relationships involving whole numbers.

**Mathworld.com Classification:**

Probability and Statistics > Probability

Foundations of Mathematics > Set Theory > General Set Theory > Inclusion-Exclusion Principle