

- Let S be the set of the 2005 smallest positive multiples of 4, and let T be the set of the 2005 smallest positive multiples of 6. How many elements are common to S and T ?

(A) 166 (B) 333 (C) 500 (D) 668 (E) 1001

2005 AMC 10 A, Problem #22— “What is the gcd of 4 and 6?”

- **Solution (D)** The sets S and T consist, respectively, of the positive multiples of 4 that do not exceed $2005 \cdot 4 = 8020$ and the positive multiples of 6 that do not exceed $2005 \cdot 6 = 12,030$. Thus $S \cap T$ consists of the positive multiples of 12 that do not exceed 8020. Let $[x]$ represent the largest integer that is less than or equal to x . Then the number of elements in the set $S \cap T$ is

$$\left\lfloor \frac{8020}{12} \right\rfloor = 668.$$

Difficulty: Medium-hard

NCTM Standard: Number and Operations Standard: Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Mathworld.com Classification: Foundations of Mathematics > Set Theory > Sets > Set