You will find these and additional problems for the AMC 10 and AMC 12 on AMC's web site: http://www.unl.edu/amc, available from the 2004 AMC 10/12 Teacher Manual directory, (http://www.unl.edu/amc/d-publication/d1-pubarchive/2003-4pub/04tm12/04amc1012tm.html) or from our Problems page archives (http://www.unl.edu/amc/a-activities/a7-

- The arithmetic mean of the nine numbers in the set $\{9, 99, 999, 9999, \ldots, 999999999\}$ is a 9-digit number M, all of whose digits are distinct. The number M does not contain the digit

(A) 0 **(B)** 2 **(C)** 4 **(D)** 6 **(E)** 8

2002 AMC 12 B, Number #1— "Definition of mean, then factor"

- **Solution (A)** The number M is equal to

$$\frac{1}{9}(9 + 99 + 999 + \ldots + 999{,}999{,}999) = 1 + 11 + 111 + \ldots + 111{,}111{,}111$$
$$= 123{,}456{,}789.$$

The number M does not contain the digit 0.

Difficulty: Easy

NCTM Standard: Data Analysis and Probability Standard for Grades 9–12: For univariate measurement data, be able to display the distribution, describe its shape, and select and calculate summary statistics.

Mathworld.com Classification:
Calculus and Analysis > Special Functions > Means > Arithmetic Mean