- The digits 1, 2, 3, 4, 5, 6, 7, and 9 are used to form four two-digit prime numbers, with each digit used exactly once. What is the sum of these four primes?

(A) 150 **(B)** 160 **(C)** 170 **(D)** 180 **(E)** 190

2002 AMC 10 A, Problem #15— "Some numbers cannot be units digits"

- **Solution (E)** The digits 2, 4, 5, and 6 cannot be the units digit of any two-digit prime, so these four digits must be the tens digits, and 1, 3, 7, and 9 are the units digits. The sum is thus

$$10(2+4+5+6)+(1+3+7+9)=190.$$

(One set that satisfies the conditions is $\{23, 47, 59, 61\}$.)

Difficulty: Medium-easy

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

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Number Theory > Prime Numbers > Prime Number