The Dunbar family consists of a mother, a father, and some children. The average age of the members of the family is 20, the father is 48 years old, and the average age of the mother and children is 16. How many children are in the family?

**(A)** $2$ **(B)** $3$ **(C)** $4$ **(D)** $5$ **(E)** $6$

## 2007 AMC 10 A, Problem #10—

**"Set up equations with two variables, and use the conditions above to eliminate one. "**

### Solution

**Answer (E):** Let $N$ represent the number of children in the family and $T$ represent the sum of the ages of all the family members. The average age of the members of the family is 20, and the average age of the members when the 48-year-old father is not included is 16, so

$$20 = \frac{T}{N+2} \quad \text{and} \quad 16 = \frac{T-48}{N+1}.$$

This implies that

$$20N + 40 = T \quad \text{and} \quad 16N + 16 = T - 48,$$

so

$$20N + 40 = 16N + 64.$$

Hence $4N = 24$ and $N = 6$.

**Difficulty:** Medium-hard
**NCTM Standard:** Data Analysis and Probability Standard: select and use appropriate statistical methods to analyze data.
**Mathworld.com Classification:** Algebra > Algebraic Equations > Linear Equation
Calculus and Analysis > Special Functions > Means > Arithmetic Mean