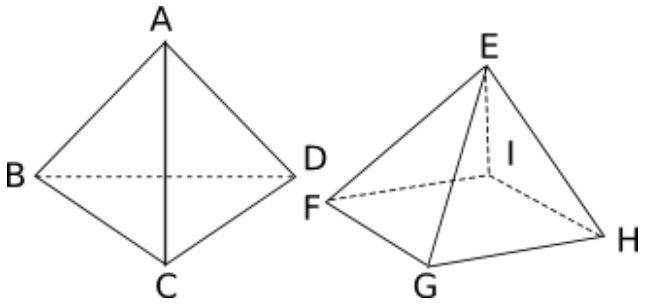
Math Lair

Errors on the Mathematics Section of the SAT

This page discusses errors that the College Board has made in the past on the mathematics section of the SAT. Errors on the mathematics section of the SAT occur very rarely, but they do occur.

The first error to be caught was found when the question appeared on the October 1980 PSAT:



> 44. In pyramids ABCD and EFGHI shown above, all faces except base FGHI are equilateral triangles of equal size. If face ABC were placed on face EFG so that the vertices of the triangles coincide, how many exposed faces would the resulting solid have?
> (A) five
> (B) six
> (C) seven
> (D) eight
> (E) nine

The wanted answer for this question was (C) seven; the reasoning was that the two solids have a total of nine faces; when the pyramids are joined, two of the faces disappear, leaving seven. However, 17-year-old Daniel Lowen noticed that, when the solids are joined, faces ABD and EGH merge into a single face, as to faces ACD and EFI, so the resulting solid only has five faces (this can be difficult to see; if you want to prove it to yourself, you could make models out of paper or cardboard).

As a result of Lowen's successful challenge, ETS (Educational Testing Service) raised the scores of 240,000 test-takers by an average of one point. The question had been previously used on an SAT in 1979, and a the scores of people who had taken that test as juniors were raised; the scores of seniors weren't adjusted as presumably they would already have been accepted (or not) to college.

An error was also found on the October 1980 SAT:

> 16. Which row contains both the square of an integer and the cube of a different integer?
> (A) 7,2,5,4,6
> (B) 3,8,6,9,7
> (C) 5,4,3,8,2

(D) 9,5,7,3,6
(E) 5,6,3,7,4

The wanted answer for this question was (B), since $8 = 2^3$ and $9 = 3^2$. However, since integers can be either positive or negative, (C) is correct as well ($4 = (-2)^2$ and $8 = 2^3$), as 17-year-old Michael Galligan of Clarkstown South High School in New York noticed. After Galligan's challenge, ETS re-scored this question; in New York State, 20,000 out of 87,000 scores were increased by an average of 10 points, and between 40 and 50 additional students were granted New York State Regents Scholarships.

Both of the above errors were first brought to the attention of the general public within a week of each other, in March 1981. Less than two years previously, New York State had passed legislation requiring publishers of college admissions tests to allow test-takers to obtain a copy of scored test questions, their answers, and the wanted answers. This "truth in testing" law was a direct cause of these two errors being spotted.

On the October 1996 SAT, the mathematics section contained an error in a "quantitative comparison" question (these types of questions are no longer found on the SAT). Depending on how the problem was interpreted, the relationship could not be determined from the information given, but that wasn't the wanted answer. The College Board acknowledged the error and re-scored the exam, resulting in around 45,000 students (13% of those who wrote the October 1996 SAT) getting an extra raw score point.

For more information, see the following:

- "Youth Outwits Merit Exam, Raising 240,000 Scores" (*New York Times*, March 17, 1981).
- A Second Student Wins Challenge on Answer to Math Exam Problem (*New York Times*, March 24, 1981).
- "Pyramids of Test Question 44 Open a Pandora's Box" (*New York Times*, April 14, 1981).
- *Standing Up to the SAT* by John Weiss, Barbara Beckwith, and Bob Schaeffer (New York: Arco, 1989).

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