

Math SAT Preparation

Introduction

When thinking about the SAT, there are two central questions that come to mind: why does the SAT give students trouble, and what is the best way to prepare for the SAT. Answers to the first question lead to answers to the second.

Why do students have trouble with the SAT?

Despite our advances in scientific knowledge, we do not know how the brain learns or how it applies what it has learned. Also, every student is different. We know that the same material will elicit different responses from different students. We also know that the same student will respond differently to different material. We just don't know why.

Putting these caveats aside, it has been my experience that there are three common reasons why students at all levels have trouble with the SAT.

First, the SAT mostly covers math that was learned in grades 7-9, specifically pre-algebra and algebra 1. This usually comes as a great surprise. To the teenage mind, ninth grade is ancient history. It can be especially bothersome to the A-student, whose focus is on solving advanced problems in pre-calculus or calculus. The B-student and C-student also may struggle if they have not learned their fundamentals as well as they should.

Second, the SAT is not like the math tests given in school. The primary purpose of a test in school is to measure the student's math knowledge. The primary purpose of the SAT is to test the student's ability to reason. For example, the SAT expects you to know how to calculate the area of a rectangle, but wants to find out if you can calculate the area when the perimeter has tripled. Therefore the two types of tests are very different. School tests give partial credit when a student shows his or her work, whereas there is no partial credit on the SAT. School tests give more weight to difficult problems and less weight to easy problems, whereas the SAT gives every problem the same weight. School tests do not subtract points for wrong answers, whereas the SAT does.

Third, although all students are nervous when they take the SAT, some students get so rattled that it impacts their scores significantly. Typical symptoms include not reading the problem completely, making silly computational errors, and not managing time properly.

Preparation Content

It would seem that standard preparation for the SAT should contain elements that directly address the three common problems described above.

To address the SAT emphasis on early math, preparation should include an extensive review of pre-algebra, algebra and geometry (grades 7-10). Together, they comprise 84% of the SAT syllabus.

To counter the unfamiliar nature of the SAT, preparation should include taking many realistic practice tests under realistic conditions. Every athlete appreciates and understands the importance of practices leading up to the big game. Ideally the practice would include playing against another team with similar qualities, on a field with similar conditions. Performers, musicians, public speakers, etc. appreciate and understand the value of rehearsal, especially the dress rehearsal when practice is the most realistic. Practice makes the unfamiliar familiar. With practice, students can learn to cope with this strange and unique test.

The best antidote to nervousness is lots of practice tests under realistic conditions. This should be coupled with learning test-taking techniques (back-solving, guessing, etc.), learning how to manage your time, and relaxation techniques.

Self-Study Versus Classroom Training Versus Tutoring

Here I will attempt to be objective despite my obvious bias as a tutor.

Self-study with a good SAT preparation book is the least expensive form of preparation and it can work for students that have the discipline to start early, divide the work into parcels, and then do the work every week leading up to the test. This is especially true for A-students.

SAT classes are generally less expensive than tutoring, though not always. Classes can work for students who attend every class, pay attention in the class, ask questions when they do not understand the material, and do the homework on time. This is especially true for A- or B-students with no weakness concentrated in a particular area (the class cannot linger on a particular topic just for one student).

One-on-one tutoring is generally the most expensive approach, though it may cost less than a SAT class. It can work for any student at any level, and is especially effective for students who lack discipline, who have irregular schedules, who have particular weaknesses, or who are especially nervous (do not “test well”). One last comment on cost: taking a class, doing badly on the SAT and getting a tutor to prepare you to re-take the SAT is more expensive than tutoring alone.

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