MATH *at* HOME

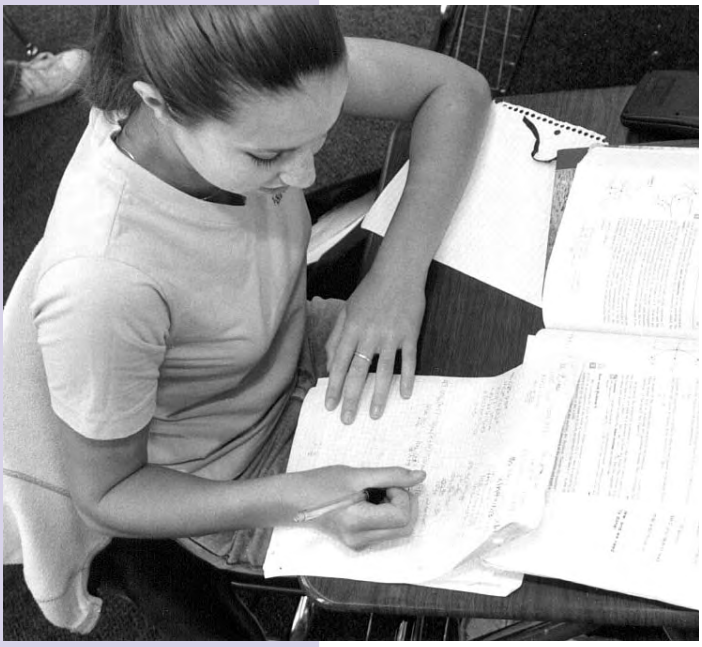
HELPING YOUR CHILDREN LEARN AND ENJOY MATHEMATICS

TAKING A LOOK AT HIGH SCHOOL MATH

Beginning with the graduating class of 2004, every high school student must pass a state "exit exam" in order to graduate. The mathematics section of the High School Exit Exam is demanding—and all students will need to understand and be able to do the mathematics that is covered on this test. The test includes statistics, data analysis and probability, number sense, measurement and geometry, mathematical reasoning, and algebra.

You can help high school students be successful in math by understanding what they are required to learn and stressing the importance of working hard. Be sure your children know you have confidence in their ability to succeed in high school math classes. Continue to speak positively about math and actively support their learning.

If your child is having difficulty in a high school mathematics course, talk to the teacher, school counselor, or principal. They can recommend strategies or provide resources your child may find helpful. You might also want to explore tutoring options, after-school programs, summer school, and print and web resources designed to provide student assistance.



To help you understand the new requirements and challenges of high school math, some key ideas are highlighted below.

THERE ARE STANDARDS FOR HIGH SCHOOL MATH

High school students now experience mathematics classes that are based on new state standards. The high school standards are focused on specific *courses* rather than on the five broad topics, or strands, that frame math learning in the lower grades. There is a detailed set of standards for algebra, geometry, statistics, probability, calculus, and other courses. These standards are listed in the publication *Mathematics Content Standards for California Public Schools* and on the Internet (www.cde.ca.gov/be/st/ss).

Courses that incorporate the new standards are more rigorous and demanding of students. They're designed to prepare students for the chal-

lenges they'll face in college and careers, both of which routinely require knowledge of higher-level mathematics.

Three years of high school math is the goal

Today, the traditional sequence of high school mathematics courses is algebra I, geometry, algebra II, and pre-calculus. "General mathematics" courses, which many parents remember from their high school years, are no longer offered.

All high school students must complete at least two years of math from the courses listed above. This is a graduation requirement. Most colleges require a full three years of high school math.

Algebra is a required course

Satisfactory completion of an algebra course is now required by state law for graduation from high school. Algebra is considered the foundation for all higher-level mathematics, so students must master it for advancement to other classes, as well as for graduation. To ensure that students are successful in algebra, many of the beginning concepts of algebra are now introduced in the elementary and middle school years. Many schools require students to take algebra in eighth grade.

AP courses provide additional challenges

If your child is successful in mathematics, he or she may have the opportunity to take Advanced Placement (AP) mathematics courses in high school. These courses offer the highest level of mathematics study available in high school and can even be counted as college credits. Taking AP math courses provides an advantage to college-bound students. Colleges and universities often give special consideration to applicants who have completed these courses.

Math learning is tested prior to graduation

Your child will be required to take the state's High School Exit Exam in tenth grade. Students who don't pass this test the first time will have the opportunity to take it again, in both the eleventh and twelfth grades. The mathematics portion of the test is designed to test students' grasp of the concepts outlined in the state standards through algebra I.

The High School Exit Exam is a demanding test, as these samples of the exam's math section demonstrate:

- What is the y-intercept of the line $2x - 3y = 12$?
- What is the length of the hypotenuse of a right triangle with a base of 5 and a height of 12?
- Identify the graph of $y = x^3$.

More information about the High School Exit Exam is available from your local high school or on the Internet at www.cde.ca.gov/ta/tg/hs.

EXERCISES, PROBLEMS, AND INVESTIGATIONS

Students don't study math exclusively by completing worksheets filled with numbers anymore. Although great emphasis is placed on learning mathematical facts and procedures, schools are also teaching students to think and communicate mathematically.

Math exercises, problems, and investigations are examples of the kinds of work students are doing in school to foster mathematics learning. The samples below illustrate how each approach leads to a different type of learning.

- **A Math Exercise:** Find the area and perimeter of a rectangle with a length of 7.5 inches and a width of 4.75 inches.

- **A Math Problem:** The perimeter of a rectangle is 36 inches. What are all the possible whole number dimensions of this rectangle?

- **A Math Investigation:** What is the relationship between the area of a rectangle and its perimeter? For a rectangle with an area of 48 square feet, what are its possible dimensions—that is, what lengths, widths, and perimeters are possible? Do all rectangles with the same perimeter have the same area? Prepare a report describing your work and your findings. Provide any charts, tables, or graphs that help explain your thinking.