PREPARING for the California High School Exit Examination

A Mathematics Study Guide

Prepared by the
California Department of Education
October 2003

Preparing for the

California High School Exit Examination

A Mathematics Study Guide

Prepared by the

California Department of Education

October 2003

Preparing for the California High School Exit Examination: A Mathematics Study Guide

© 2003 California Department of Education

Permission is granted in advance for reproduction of this document for educational purposes. The content must remain unchanged and in its entirety as published by the California Department of Education. To obtain permission to reproduce the information (text or graphics) contained in this document for any commercial purpose, submit the specifics of your request in writing to the Copyright Program Office, California Department of Education, CDE Press, 1430 N Street, Suite 3410, Sacramento, CA 95814. Fax: (916) 322-1754.

JACK O'CONNELL
State Superintendent of Public Instruction

CALIFORNIA
DEPARTMENT
OF
EDUCATION

1430 N Street
P.O. Box 944272
Sacramento, CA
94244-2720

A MESSAGE TO STUDENTS AND PARENTS

In 1999, California enacted a law requiring that every California public school student pass an examination to receive a high school diploma. The exam's purpose is to ensure that high school graduates can use mathematics and read and write in English competently. In July 2003, the California State Board of Education decided that the Class of 2006, who are tenth graders in 2003–04, will be the first students required to pass the California High School Exit Examination (CAHSEE) to receive a diploma. We realize that many students and their families find the prospect of taking this test stressful. Therefore, we are pleased to be able to provide students and their parents with this *Mathematics Study Guide,* which is designed to help students prepare for and pass the CAHSEE.

The CAHSEE will be administered over two days. On the first day, students will take the English-language arts portion of the test; on the second day, they will take the mathematics portion. All of the questions on the CAHSEE are based on California's academic content standards in English-language arts and mathematics. These standards outline what students are expected to know and be able to do by the end of each school year from kindergarten through high school.

The focus of this study guide is the mathematics part of the exam. It includes questions from previous CAHSEEs and explains how to determine the correct answers; it gives studying and test-taking tips; and it answers frequently asked questions. A similar study guide for English-language arts is also available.

Passing the CAHSEE is an achievement for students, and we hope you find this guide helpful. If you have questions or would like more information about the CAHSEE, please contact your high school's principal or your school district's testing office. The California Department of Education's CAHSEE Web site at *<http://www.cde.ca.gov/statetests/cahsee/>* is also an excellent resource.

Good luck with this exam!

JACK O'CONNELL
State Superintendent of Public Instruction

CALIFORNIA
DEPARTMENT
OF
EDUCATION

1430 N Street
P.O. Box 944272
Sacramento, CA
94244-2720

UN MENSAJE A LOS ALUMNOS Y SUS PADRES O GUARDIANES

En 1999, el estado de California pasó una ley que exige que todo alumno de una escuela pública de California apruebe un examen para recibir su diploma de preparatoria o *high school.* El propósito del examen es el de asegurar que los alumnos que se gradúen de la preparatoria o *high school* puedan leer y escribir en inglés y puedan usar las matemáticas.

En Julio del 2003, la Junta Directiva de Educación del Estado decidió que la clase del 2006, los alumnos que están en décimo grado en el año escolar 2003–04, serán los primeros a quienes se les exigirá pasar el examen *California High School Exit Exam*—también conocido como CAHSEE por sus siglas en inglés—para recibir su diploma de preparatoria o *high school.* Nosotros estamos concientes de que el tener que tomar este examen es una fuente de tensión para los alumnos y sus familias. Por eso nos complace proveer a los alumnos y sus padres o guardianes con esta *Guía de Estudio de Matemáticas,* la cual esta diseñada para ayudar a los alumnos a prepararse para pasar el CAHSEE.

El CAHSEE se administra durante dos días. El primer día los alumnos tomarán la sección que se enfoca en los conocimientos de inglés o *English-language arts.* Durante el segundo día los alumnos tomarán la sección del examen que se enfoca en las matemáticas. Todas la preguntas del CAHSEE están basadas en los estándares estatales del contenido de inglés o *English-language arts* y de matemáticas. Estos estándares describen lo que se espera que los alumnos sepan y puedan hacer al final de cada año escolar desde el kinder hasta el 12° grado.

Esta guía de estudio se enfoca en la sección del examen que cubre los conocimientos de **matemáticas.** Incluye preguntas de exámenes previos y provee ayuda para determinar cual es la mejor respuesta; presenta estrategias para estudiar y para responder a preguntas; y responde a las preguntas más frecuentes acerca del examen. Existe una guía similar para la parte del examen que se concentra en inglés o *English-language arts.*

Pasar el CAHSEE es un gran logro para los alumnos y esperamos que esta guía les ayude. Si tiene preguntas o le gustaría obtener más información acerca del examen por favor llame al director de su escuela o a la oficina de evaluación de su distrito escolar. La página de Web del CAHSEE del Departamento de Educación de California también un recurso excelente. Visítela en: *<http://www.cde.ca.gov/statetests/cahsee/>*.

¡Buena suerte con este examen!

ACKNOWLEDGMENTS

Much appreciation goes to the educators who contributed to the development of material provided in this study guide.

University of California
Office of the President
Elizabeth Stage, Director
Mathematics and Science
Professional Development

Harold Asturias, Deputy Director
Mathematics and Science
Professional Development

Susan Arnold, Assistant to the Director
Mathematics and Science
Professional Development

Dan Brutlag, Secondary Leader
Mathematics Professional
Development Institutes

Beverly Braxton, Elementary Leader
Mathematics Professional
Development Institutes

Patrick Callahan, Mathematician in Residence
Mathematics Professional
Development Institutes

Dick Stanley, Mathematician in Residence
Mathematics Professional
Development Institutes

California Department of Education
Geno Flores, Deputy Superintendent
Assessment and Accountability Branch

Phil Spears, Director
Standards and Assessment Division

Jan Chladek, Administrator
CAHSEE Office

Phil Lafontaine, Administrator
Mathematics and Science Leadership Unit

Yvonne Evans, Consultant
Mathematics and Science Leadership Unit

Lily Roberts, Consultant
CAHSEE Office

William Tarr, Jr., Consultant
Programs and Policy Support Office

Jessica Valdez, Consultant
CAHSEE Office

Other Contributors
Meg Holmberg, Writing Consultant
EEPS Media

Tim Erickson, Writing Consultant
EEPS Media

Carlos Cabana, Mathematics Department
Co-Chair
San Lorenzo High School
San Lorenzo Unified School District

CONTENTS

Frequently Asked Questions 1

Preguntas Hechas Frecuentemente 3

Information for Students 5

How This Study Guide Can Help You 5
Tips for Studying 5
Tips for Multiple-Choice Questions 5
Tips for Using the Answer Sheet 8
What Is On the CAHSEE? 9

1. Number Sense Strand 11

What Do the Number Sense Standards Ask Me To Do? 11
Why Is Number Sense Important? 11
How Will the CAHSEE Test My Knowledge of Number Sense? 12
Using Number Sense Standards in a Real-Life Situation 17
Number Sense Practice Test 21

2. Statistics, Data Analysis, and Probability Strand 23

What Do the Statistics, Data Analysis, and Probability Standards Ask Me to Do? 23
Why Are Statistics, Data Analysis, and Probability Important? 24
How Will the CAHSEE Test My Knowledge of Statistics, Data Analysis, and Probability? 24
Using Statistics, Data Analysis, and Probability Standards in a Real-Life Situation 29
Statistics, Data Analysis, and Probability Practice Test 33

3. Measurement and Geometry Strand 37

What Do the Measurement and Geometry Standards Ask Me to Do? 37
Why Are Measurement and Geometry Important? 38
How Will the CAHSEE Test My Knowledge of Measurement and Geometry? 38
Using Measurement and Geometry Standards in a Real-Life Situation 43
Measurement and Geometry Practice Test 46

4. Algebra and Functions Strand 49

What Do the Algebra and Functions Standards Ask Me to Do? 49
Why Are Algebra and Functions Important? 49
How Will the CAHSEE Test My Knowledge of Algebra and Functions? 50
Algebra and Functions Practice Test 57

5. Mathematical Reasoning Strand 59

What Do the Mathematical Reasoning Standards Ask Me to Do? 59
Why Is Mathematical Reasoning Important? 59
How Will the CAHSEE Test My Knowledge of Mathematical Reasoning? 60
Mathematical Reasoning Practice Test 63

6. Algebra I Strand 65

What Do the Algebra I Standards Ask Me to Do? 65
Why Is Algebra I Important? 65
How Will the CAHSEE Test My Knowledge of Algebra I? 66
Using Algebra I Standards in a Real-Life Situation 71
Algebra I Practice Test 74

Appendix: CAHSEE Math Vocabulary 77

FREQUENTLY ASKED QUESTIONS

Below are some questions that are often asked about the California High School Exit Examination (CAHSEE). If you have a question that is not answered here, call your high school's principal or your school district's testing office. You can find answers to other frequently asked questions on CDE's CAHSEE Web site, *<http://www.cde.ca.gov/statetests/cahsee/>*.

What does the CAHSEE cover?
The CAHSEE has two parts: English-language arts and mathematics.

The English-language arts part of the CAHSEE tests state content standards through grade ten. The reading section includes vocabulary, decoding, comprehension, and analysis of information and literary texts. The writing section covers writing strategies, applications, and the conventions of standard English (for example, grammar, spelling, and punctuation).

The mathematics part of the CAHSEE tests state content standards in grades six and seven and Algebra I. The exam includes statistics, data analysis and probability, number sense, measurement and geometry, mathematical reasoning, and algebra. Students are also asked to demonstrate a strong foundation in computation and arithmetic, including working with decimals, fractions, and percentages.

What kinds of questions are on the CAHSEE?
Most of the questions on the CAHSEE are multiple choice. However, the English-language arts part of the exam also includes one essay question (writing task). The exam is given only in English, and all students must pass the exam in English to receive a high school diploma. Released questions from previous administrations of the CAHSEE can be found throughout this guide and on CDE's Web site.

When do students first take the CAHSEE?
Students must take the exam for the first time in the second part of their tenth-grade year.

When (and how) do students find out whether they have passed the CAHSEE?
School districts receive student score reports about two months after the date of the exam. One copy is to be mailed to the student's home and another copy is to be kept in the student's permanent record. It is important that parents or guardians keep a copy of the student report for their records. The State of California does *not* keep a copy of the scores. All individual student scores are confidential. Only group scores (for entire schools and districts) are made public. Scores may range from 250 to 450. A passing score is 350 or higher.

What if a student does not pass the first time?
Students who do not pass the exam in the tenth grade will have several opportunities to take it again during their junior and senior years. Once they have passed either part of the exam, they will not be tested again on that part. By state law, students who do not pass a part of the exam must be offered extra instruction to learn what they need to know in order to pass. It is up to each school and district to decide how to provide this instruction. To find out what type of help is available and when the exam will be given again at your school, contact the principal or a counselor at your high school.

What if a student has special needs?
If a student has an Individualized Education Program (IEP) or a Section 504 Plan, it should describe any special arrangements the student is entitled to while taking an exam.

Special arrangements for taking the CAHSEE are categorized as either "accommodations" or "modifications." It is important to understand the difference between them because it may affect a student's score on the exam.

An **accommodation** does not alter what the test measures—for example, taking extra breaks during the exam, or using a test booklet with large print.

A **modification** fundamentally alters what the exam measures—for example, using a calculator on the mathematics part of the exam, or hearing an audio presentation of the questions on the English-language arts part of the exam.

Students must be permitted to use any accommodations or modifications on the CAHSEE that are specified for testing purposes in their IEP or Section 504 Plan. Students who take the exam using an *accommodation* receive a score just as any other student does. However, students who use a *modification* receive a numeric score followed by the words "NOT VALID." If the student receives a score of 350 or higher, the student's principal, may request a "waiver" from the local school board at the parent's or guardian's request. This is done by presenting evidence proving that the student has gained the knowledge and skills otherwise needed to pass the CAHSEE.

More information about the procedure for requesting a waiver, including a list of modifications and accommodations, can be accessed on CDE's CAHSEE Web site or by talking with a high school principal.

What if a student is still learning to speak and read in English?

All students must pass the CAHSEE to be eligible for a high school diploma.

Students who are English learners are required to take the CAHSEE in grade ten with all students. However, the law says that during their first 24 months in a California school, they are to receive six months of special instruction in reading, writing, and comprehension in English. A student who does not pass the exam in grade 10 will have additional opportunities to pass it.

Preguntas Hechas Frecuentemente

A continuación encontrará respuestas a las preguntas más frecuentes sobre el Examen *California High School Exit Examination* o CAHSEE. Si tiene preguntas cuyas respuestas no aparezcan aquí, por favor llame al director de su escuela o a la oficina de evaluación de su distrito escolar. Puede encontrar respuestas a otras preguntas frecuentes en la página de Web del Departamento de Educación de California o *CDE* y del CAHSEE *<http://www.cde.ca.gov/statetests/cahsee/>*.

¿Qué cubre el CAHSEE?
El CAHSEE tiene dos secciones: inglés y matemáticas.

La sección de inglés del CAHSEE cubre los estándares estatales del contenido abarcando hasta el décimo grado inclusive. La parte correspondiente a la lectura incluye vocabulario, decodificación, comprensión y análisis de textos de información y textos de literatura. En la parte de escritura, el examen cubre estrategias de la escritura, aplicaciones y las reglas del inglés (por ejemplo gramática, ortografía y puntuación).

La parte de matemáticas del CAHSEE cubre los estándares estatales del sexto y séptimo grado y los de álgebra I. El examen incluye estadística, análisis de datos y probabilidad, teoría de los números, medidas y geometría, razonamiento matemático y álgebra. Se espera que los alumnos demuestren tener destreza en cómputo y aritmética, incluyendo la habilidad de trabajar con decimales, fracciones y porcentajes.

¿Qué clase de preguntas contiene el CAHSEE?
La mayor parte de las preguntas en el CAHSEE son preguntas de selección múltiple. Sin embargo, la sección de inglés también incluye una pregunta en forma de ensayo (*writing task*). El examen se administra en inglés solamente y todos los alumnos deben aprobarlo en inglés para recibir su diploma de preparatoria o *high school*. En esta guía de estudio hay ejemplos de preguntas que han aparecido en exámenes previos. Otros ejemplos pueden encontrarse en la página de Web del Departamento de Educación de California o *CDE* y del CAHSEE *<http://www.cde.ca.gov/statetests/cahsee/>*.

¿Cuándo toman los alumnos el CAHSEE por primera vez?
Los alumnos deberán tomar el examen por primera vez en la segunda parte de su décimo grado.

¿Cuándo (y cómo) sabrán los alumnos si aprobaron o no el CAHSEE?
Los distritos escolares reciben los reportes de las calificaciones obtenidas por sus alumnos aproximadamente dos meses después de haber administrado el examen. Una copia se envía directamente a la casa del alumno y otra copia se archiva con el expediente permanente del alumno. Es importante que los padres o guardianes guarden una copia del reporte del alumno para sus archivos. El estado de California *no* retiene ninguna copia de los resultados. Los resultados de cada alumno son confidenciales. Se publican solamente resultados de grupos (de escuelas enteras y distritos). Las calificaciones varían entre los 250 a los 450 puntos. Se requiere una calificación de 350 ó más para aprobar.

¿Qué pasa si un alumno no aprueba la primera vez?
Los alumnos que no aprueben el examen en el décimo grado tendrán varias oportunidades de tomarlo de nuevo durante el 11º y el 12º grado. Una vez que hayan aprobado una de las dos secciones del examen no tendrán que tomar esa parte de nuevo. La ley estatal exige que los alumnos que no aprueben alguna parte del examen reciban educación adicional que les ayude a aprender lo que necesitan saber para aprobarlo. Cada escuela y cada distrito decidirá cómo proveer esa educación adicional. Para saber que tipo de ayuda hay disponible en la escuela de su hijo o hija y cuando el examen será administrado de nuevo, llame al director o al consejero de la escuela.

¿Qué pasa si un alumno tiene necesidades especiales?

Si un alumno tiene un Programa de Estudios Individualizado o *Individualized Education Program*—también conocido como IEP por sus siglas en inglés o un Plan de Sección 504, estos deberán describir los arreglos especiales a los que el alumno tiene derecho al tomar el examen.

Las dos clases de arreglos especiales para tomar el CAHSEE son "adaptaciones" y "modificaciones". Es importante entender la diferencia entre estas dos clases de arreglos porque pueden afectar la calificación que el alumno obtenga en el examen.

> Una **adaptación** no altera lo que el examen evalúa—por ejemplo, tomar descansos adicionales durante el examen o usar un cuadernillo de examen con letras grandes.
>
> Una **modificación** cambia fundamentalmente lo que el examen está evaluando—por ejemplo, usar una calculadora en la parte de matemáticas o escuchar una grabación de las preguntas en la sección de inglés.

Los alumnos tienen derecho a cualquier adaptación o modificación para tomar el CAHSEE que haya sido estipulada en su programa de IEP o plan de Sección 504. Los alumnos que tomen el examen usando una *adaptación* recibirán una calificación como todos los demás. Sin embargo, los alumnos que usen una *modificación* recibirán su calificación numérica seguida de las palabras "NOT VALID" (NO VÁLIDA). Sin embargo, si el alumno obtiene 350 puntos ó más, el director de la escuela del alumno debe pedir a petición de los padres o guardianes una exención o *waiver* a la junta escolar de su localidad. Este proceso se lleva a cabo presentando pruebas que el alumno ha adquirido los conocimientos y las destrezas necesarias que de otra manera sean necesarias para aprobar el CAHSEE.

Puede encontrar más información acerca del proceso para pedir esta exención o waiver, incluyendo una lista de posibles adaptaciones y modificaciones en la página de Web del CAHSEE del Departamento de Educación de California o hablando con el director de su escuela.

¿Qué pasa si un alumno todavía está aprendiendo a hablar y leer inglés?

Todos los alumnos deben pasar el CAHSEE para obtener su diploma de preparatoria o *high school*.

Los alumnos que están aprendiendo inglés o *English learners* tienen que tomar el CAHSEE en el décimo grado como todos los demás. Sin embargo, la ley exige que durante sus primeros 24 meses en una escuela de California deberán recibir seis meses de educación especializada en lectura, escritura y comprensión del inglés. Todo alumno que no apruebe el examen tendrá otras oportunidades para hacerlo.

INFORMATION FOR STUDENTS

This section of the study guide has been written just for you. To receive a high school diploma, you must pass the CAHSEE, and we want to make sure that you do. Although you will have several opportunities throughout high school to take the CAHSEE, wouldn't it be great if you could pass it the next time you take it?

How This Study Guide Can Help You

First we offer some tips for studying and tips for taking a multiple-choice exam—the kind that asks you to pick from four possible answers to a question. The mathematics part of the CAHSEE consists of multiple-choice questions. During the exam, if you're confused by a question or you're not completely certain of the answer, remembering these tips will help you decide what to do.

Next, we describe the mathematics you need to know for the exam and why it's important to know it. We provide released questions from previous CAHSEE administrations and go step-by-step to find the correct answers. Although we cannot use questions that will appear on the actual test you will take, we believe these released questions and explanations should help you succeed on the real test.

Tips for Studying

- **Start early to prepare.**
  Don't wait until the last minute to read this study guide. Find a place where it's easy to concentrate, and set aside some time each week to prepare. Starting early will ensure you have time to get help if you have questions.

- **Don't go it alone!**
  If you have trouble understanding any part of this guide, get help! Share it with a teacher, a counselor, your parents, or guardian. Ask them to look it over with you. You can also gather a group of students and work through the guide together.

  If you have already taken the CAHSEE, your score report will show which parts of the mathematics exam gave you trouble. When you get help, take the score report with you so the person helping you can concentrate on the topics that challenge you the most.

  By California law, your school district must offer remedial or supplemental instruction to students who have not passed the exam. To find out what your school offers, ask your math teacher or principal.

Now for those test-taking tips . . .

Tips for Multiple-Choice Questions

The mathematics part of the CAHSEE has 92 multiple-choice questions (80 that are scored, plus another 12 that the test-makers are trying out for future use). This section shows some strategies that will help you use your time well on these questions. Some apply to any multiple-choice exam; others are specific to mathematics.

- **Answer easy questions first.**
  Every question is worth the same number of points—no matter how difficult it is. So on your first time through, answer the easy questions to make certain you get credit for them. Skip over the harder questions initially, but mark them in your test booklet so that you can return to them later. (Unlike other tests you might have taken, it's OK to write in the CAHSEE test booklet.)

- **It's okay if you don't know the answer to every question.**
  You don't have to get every question right to pass the exam. If you don't do well on one part of the mathematics exam, you can make up for it on another because there is just one score for mathematics. Also, if you need extra time, you can keep working through the school day. (Just tell the person administering the exam that you need more time.) And, of course, if you don't pass, you'll have chances to take the exam again. So, take a deep breath, relax, and focus on doing the best you can.
- **Eliminate choices that you know are wrong.**
  As you work on a problem, look back at the answer choices. In your booklet (not on the answer sheet), cross out any choices that you *know* are wrong. That way you might not have to finish the whole problem to find the only reasonable choice. We will use this strategy in examples below.

Now let's look at a couple of examples using released questions from previous administrations of the CAHSEE. *Many test items are easier than they look at first glance.* And usually, the computation—the arithmetic—will be simpler than what you have been doing in math class.

In these examples, we'll use several of the tips we've mentioned—but watch especially how we eliminate answers that are wrong.

Example 1

Released CAHSEE Question

Tina is filling a 45 gallon tub at a rate of 1.5 gallons of water per minute. At this rate, how long will it take to fill the tub?

A 30.0 minutes

B 43.5 minutes

C 46.5 minutes

D 67.5 minutes

M02688

Solution

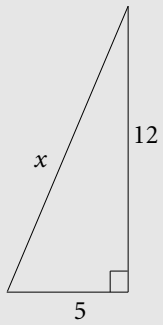
To find the correct answer to this question, you're supposed to divide 45 ÷ 1.5 to get 30. But imagine that you're nervous and you can't decide whether to add, subtract, multiply, or divide.

So think about the situation and use what you know. The tub holds 45 gallons. Tina is putting in 1.5 gallons every minute. How much water is there after one minute? 1.5 gallons. What about *ten* minutes? That would be 15 gallons (10 times 1.5). So after 20 minutes Tina has 30 gallons, and 30 minutes is 45 gallons.

Let's look at a different strategy for the same problem. If the water were coming in at 1.0 gallon per minute, it would take 45 minutes to fill. But the water is coming in *faster,* so it will take *less* time to fill the tub. Only options A and B are less than 45 minutes. (You just eliminated options C and D!) But option B (43.5 minutes) is only *slightly* less, while 1.5 gallons per minute is quite a bit more than 1.0. So the correct answer must be option **A**.

Example 2

Released CAHSEE Question



What is the value of *x* in the triangle shown above?

A 11

B 13

C 17

D 169

M02446

Solution

Here is a geometry question, and a chance for making a *visual* estimate. You could use the Pythagorean theorem to solve the problem, but you don't have to. Look at the diagram. If it helps, you can make a "paper ruler" out of part of your booklet and use it to measure the diagram.

The length *x* has to be more than 12. But no way is it 169. So the answer is either 13 or 17. (You just eliminated options A and D!) But notice: 17 is the total distance along the two legs, 12 + 5. Segment *x* must be shorter than that, because it goes straight. So the correct answer is **B**.

Is it cheating to choose an answer without actually computing it? NO. It's demonstrating what you know and what you can do *on a multiple-choice exam.*

The test makers care that you know how big numbers are, that you understand variables, and that you can reason about geometric figures. They care that you know the basics well. But it's not so important whether you can do complicated arithmetic with paper and pencil.

Should you know how to compute the answer? Of course you should, and there will be many questions where you will have to compute or do some algebra to tell which answer is correct. But if you get stumped, some of these strategies might help you get a question right.

Here are some more tips:

- **Write in your booklet!**
  Cross out answers you know are wrong. Draw stars by questions you need to come back to. Draw diagrams of word problems. Mark distances in geometry problems. Use the test booklet as scratch paper for rough calculations. Remember: your answer sheet must be neat with no stray marks, but you can work on your test booklet.

- **Don't give up without going part way.**
  Some students give up if they think they can't solve the whole problem. But if you do as much as you can, you might be able to eliminate some answers—maybe even all but one.
- **You don't have to read all the answers to start working on a problem.**
  If the answers are confusing, it may be best to start in on the problem and then look at the answers once you have an idea of what's going on. Go back and forth between working on the problem and looking at the answers until they begin to make sense.
- **Reason backwards from the answers.**
  This is especially important in some algebra questions. If you can't solve an equation, you can plug in the possible answers and see which one works. Sometimes just trying one answer helps you see what's going on.
- **Think about the basic concept; be sure you're thinking about the right thing.**
  Many of the items on the test just check to see if you know what terms mean and how to perform basic tasks. Be careful, for example, that you don't compute the *radius* when you really need the *diameter,* or confuse *slope* with *intercept.*
- **Check your work.**
  When you finish the last question, go back over the exam to review your thinking and to check for any careless mistakes. **Remember that the CAHSEE is an untimed test, and you can ask for more time if you need it.**
- **If you can eliminate some wrong answers, guess.**
  Suppose you can tell that two of the four answers are wrong, but you can't figure out which of the remaining two answers is right. Then you should guess; you have a 50-50 chance of being right.

And one final tip that applies to *this* multiple-choice exam:

- **If you have no idea, guess anyway.**
  Unlike some multiple-choice tests, the CAHSEE does *not* subtract points for wrong answers. That means it will be to your advantage to answer *every* question. After all, even if you know nothing about the problem, you have a one-out-of-four chance of getting the right answer. Before you turn in your answer form, make certain you've filled in an answer for each question.

Tips for Using the Answer Sheet

- Use only a #2 pencil.
- Be careful not to make extra marks on the answer sheet. The machine that scores the exam can't tell them apart from your answers.
- Mark only one answer to each question. If you change an answer, erase the original answer completely.
- Check now and then to make certain you're in the right place on the answer sheet. That way you'll know quickly if you've accidentally skipped a line.

What Is On the CAHSEE?

The CAHSEE is based on academic content standards set by the State of California. These standards highlight what a student should know and be able to do by the end of each grade in each subject area. For Kindergarten through grade 7, the standards are grouped into five "strands"—topics that weave through the curriculum at each grade level, becoming more complex each year. For grades 8 through 12, the standards are grouped into disciplines such as Algebra I, geometry, and trigonometry.

The mathematics part of the CAHSEE tests grade 6 and 7 standards from each strand, plus standards from Algebra I. (For the purposes of this study guide, Algebra I will be referred to as a strand.) Below is a brief description of each strand and the number of questions on the CAHSEE that relate to it:

1. **Number Sense (NS):** *14 questions based on 10 standards*
   Students demonstrate a foundational understanding of numbers and ways they are represented.
2. **Statistics, Data Analysis, Probability (P):** *12 questions based on 7 standards*
   Students determine ways to collect, analyze, organize, and display data.
3. **Measurement and Geometry (MG):** *17 questions based on 10 standards*
   Students select and use appropriate units; estimate and calculate measurements for the length, area, and volume of geometric figures; understand scaling in scale drawings and how changes in linear dimension affect area and volume; and solve problems involving dimensional analysis and conversion from one unit to another.
4. **Algebra and Functions (AF):** *17 questions based on 10 standard*s
   Students formalize patterns, functions, and generalizations; work with algebraic symbols, expressions with variables, and graphical representations; understand different meanings and uses of variables; develop concepts of proportionality; and recognize and generate equivalent expressions, solve linear equations, and effectively use formulas.
5. **Mathematical Reasoning (MR):** *8 questions based on 6 standards*
   Students analyze problems, use inductive and deductive reasoning, evaluate the reasonableness of solutions, generalize results, and apply them to new problems.
6. **Algebra I (AI):** *12 questions based on 10 standards*
   Students calculate with symbols and demonstrate symbolic reasoning.

In the pages that follow, there is a chapter for each of the six strands. Each chapter includes a section with each of these headings:

- **What do the standards ask me to do?**
  This section includes a brief summary of the content standards you'll be tested on and a list of vocabulary words that have appeared on the CAHSEE during past administrations.
- **Why is this strand important?**
  Math isn't just for school. We all need math in our everyday lives as citizens, employees, wise consumers, and as students beyond high school. Included for each strand is a short paragraph that tells you how the math of this strand might be important for you.
- **How will the CAHSEE test my knowledge?**
  To answer this question, this section includes several questions that have appeared on the CAHSEE previously along with answers and explanations.

- **Using these standards in a real-life situation—anchor problems**
  To solve real-life math problems, you often need to use the skills and ideas from more than just one standard. So to help you get the "big picture," each chapter (except for Mathematical Reasoning) includes one large, real-life mathematical problem involving several of the CAHSEE standards—we refer to this as an *anchor problem*. The CAHSEE itself won't ask you to do large problems such as the anchor problems. But when studying for the CAHSEE, many students find that it's easier to remember how to solve one large problem, rather than trying to recall how to do each of the standards individually. If the 53 standards on which the CAHSEE is based seem to be floating around in your head, these five large problems might serve as "anchors" so you can more easily recall many of the skills and ideas you'll need on the day of the test. When you get to an anchor problem in this study guide, you should first give it a try and then read its solution on the pages that follow.
- **Practice Test**
  Each chapter concludes with a set of actual CAHSEE questions released from prior administrations that you can try for practice.

Now it's time to look at each of the six mathematics strands that you'll encounter when you take the CAHSEE.