

# *California High School Exit Examination*

## **Mathematics Released Test Questions**



California Department of Education  
October 2004

## Introduction

Beginning with the 2005–06 school year, every student must pass the California High School Exit Examination (CAHSEE) to receive a high school diploma from a California public school. Students in the Class of 2006 had their first opportunity to take the CAHSEE in February and March 2004.

All questions on the CAHSEE are evaluated by committees of content experts, including California educators, teachers, and administrators, to ensure the questions' appropriateness for measuring the designated California academic content standards in English-language arts and mathematics. In addition to content, all items are reviewed and approved to ensure their adherence to the principles of fairness and to ensure no bias exists with respect to characteristics such as gender, ethnicity, and language.

This document combines released test questions that appeared on CAHSEE test forms in 2001, 2002 and 2003, and contains new test questions from 2004. The questions are grouped by strand (e.g., Number Sense). At the beginning of each strand section is a list of the specific standards assessed on the CAHSEE. Following a group of questions is a table that gives the correct answer for each question, the content standard each question is measuring, and the year each question originally appeared on the CAHSEE.

The following table lists each strand, the number of items that appear on the exam, and the number of released test questions that appear in this document.

<b>STRAND</b>	<b>NUMBER OF QUESTIONS ON EXAM</b>	<b>NUMBER OF RELEASED TEST QUESTIONS</b>
• Number Sense (NS)	14	27
• Statistics, Data Analysis, and Probability (PS)	12	20
• Algebra and Functions (AF)	17	26
• Measurement and Geometry (MG)	17	30
• Mathematical Reasoning (MR)	8	14
• Algebra I (1A)	12	27
<b>TOTAL</b>	<b>80</b>	<b>144</b>

In selecting test questions for release, three criteria are used: (1) the questions adequately cover the content standards assessed on the CAHSEE; (2) the questions demonstrate a range of difficulty; and (3) the questions present a variety of ways each standard can be assessed. These released test questions do not reflect all of the ways the standards may be assessed. Released test questions will not appear on future tests.

For more information about the CAHSEE, visit the CDE's Web site at <http://www.cde.ca.gov/ta/tg/hs>.

## NUMBER SENSE

The following ten California mathematics academic content standards from the Number Sense strand are assessed on the CAHSEE by 14 test questions and are represented in this booklet by 27 released test questions. These questions represent only a few of the ways in which these standards may be assessed on the CAHSEE.

<b>GRADE 7 — NUMBER SENSE</b>	
<b>Standard Set 1.0</b>	<b>Students know the properties of, and compute with, rational numbers expressed in a variety of forms:</b>
1.1	Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.
1.2	Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.
1.3	Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.
1.6	Calculate the percentage of increases and decreases of a quantity.
1.7	Solve problems that involve discounts, markups, commissions, and profit, and compute simple and compound interest.
<b>Standard Set 2.0</b>	<b>Students use exponents, powers, and roots, and use exponents in working with fractions:</b>
2.1	Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base.
2.2	Add and subtract fractions by using factoring to find common denominators.
2.3	Multiply, divide, and simplify rational numbers by using exponent rules.
2.4	Use the inverse relationship between raising to a power and extracting the root of a perfect square integer; for an integer that is not square, determine without a calculator the two integers between which its square root lies and explain why.
2.5	Understand the meaning of the absolute value of a number; interpret the absolute value as the distance of the number from zero on a number line; and determine the absolute value of real numbers.

## Number Sense

1. The radius of the earth's orbit is 150,000,000,000 meters. What is this number in scientific notation?

A  $1.5 \times 10^{-11}$   
 B  $1.5 \times 10^{11}$   
 C  $15 \times 10^{10}$   
 D  $150 \times 10^9$

M00213

2.  $3.6 \times 10^2 =$

A 3,600  
 B 36  
 C 360  
 D 3,600

M00036

3. The five members of a band are getting new outfits. Shirts cost \$12 each, pants cost \$29 each, and boots cost \$49 a pair. What is the total cost of the new outfits for all of the members?

A \$90  
 B \$95  
 C \$450  
 D \$500

M00331

4.  $\frac{11}{12} - \left(\frac{1}{3} + \frac{1}{4}\right) =$

A  $\frac{1}{3}$   
 B  $\frac{3}{4}$   
 C  $\frac{5}{6}$   
 D  $\frac{9}{5}$

M02048

5. Which of the following numerical expressions results in a negative number?

A  $(-7) + (-3)$   
 B  $(-3) + (7)$   
 C  $(3) + (7)$   
 D  $(3) + (-7) + (11)$

M00116

6. One hundred is multiplied by a number between 0 and 1. The answer has to be

A less than 0.  
 B between 0 and 50 but not 25.  
 C between 0 and 100 but not 50.  
 D between 0 and 100.

M00275

**Number Sense**

7. John uses  $\frac{2}{3}$  of a cup of oats per serving to make oatmeal. How many cups of oats does he need to make 6 servings?

A  $2\frac{2}{3}$

B 4

C  $5\frac{1}{3}$

D 9

M23015

8. If Freya makes 4 of her 5 free throws in a basketball game, what is her free throw shooting percentage?

A 20%

B 40%

C 80%

D 90%

M00223

9. Some students attend school 180 of the 365 days in a year. About what part of the year do they attend school?

A 18%

B 50%

C 75%

D 180%

M00047

10. The cost of an afternoon movie ticket last year was \$4.00. This year an afternoon movie ticket costs \$5.00. What is the percent increase of the ticket from last year to this year?

A 10%

B 20%

C 25%

D 40%

M02158

11. The price of a calculator has decreased from \$12.00 to \$9.00. What is the percent of decrease?

A 3%

B 25%

C 33%

D 75%

M02868

12. Sally puts \$200.00 in a bank account. Each year the account earns 8% simple interest. How much interest will be earned in three years?

A \$16.00

B \$24.00

C \$48.00

D \$160.00

M02119

## Number Sense

13. A pair of jeans regularly sells for \$24.00. They are on sale for 25% off. What is the sale price of the jeans?

A \$6.00  
 B \$18.00  
 C \$20.00  
 D \$30.00

M02870

14. A CD player regularly sells for \$80. It is on sale for 20% off. What is the sale price of the CD player?

A \$16  
 B \$60  
 C \$64  
 D \$96

M02425

15. Jana bought a car for \$4200 and later sold it for a 30% profit. How much did Jana sell the car for?

A \$1260  
 B \$2940  
 C \$5460  
 D \$7140

M10580

16. Which number equals  $(2)^{-4}$ ?

A  $-8$   
 B  $-\frac{1}{16}$   
 C  $\frac{1}{16}$   
 D  $\frac{1}{8}$

M10015

17.  $\frac{10^{-2}}{10^{-4}} =$

A  $10^{-6}$   
 B  $10^{-2}$   
 C  $10^2$   
 D  $10^8$

M02832

18. Which of the following is equivalent to  $7^{-6} \cdot 7^4$ ?

A  $7^{-24}$   
 B  $7^{-10}$   
 C  $7^{-2}$   
 D  $7^2$

M12679

**Number Sense**

19. Which fraction is equivalent to  $\frac{5}{6} + \frac{7}{8}$ ?

A  $\frac{35}{48}$

B  $\frac{6}{7}$

C  $\frac{20}{21}$

D  $\frac{41}{24}$

M12713

20. Which of the following is the prime factored form of the lowest common denominator of  $\frac{7}{10} + \frac{8}{15}$ ?

A  $5 \times 1$

B  $2 \times 3 \times 5$

C  $2 \times 5 \times 3 \times 5$

D  $10 \times 15$

M02826

21. What is  $\frac{3}{4} - \frac{1}{6}$ ?

A  $\frac{1}{6}$

B  $\frac{1}{3}$

C  $\frac{7}{12}$

D  $\frac{11}{12}$

M13552

22.  $(3^8)^2 =$

A  $3^4$

B  $3^6$

C  $3^{10}$

D  $3^{16}$

M02406

23.  $4^3 \times 4^2 =$

A  $4^5$

B  $4^6$

C  $16^5$

D  $16^6$

M02661

24. The square root of 150 is between

A 10 and 11.

B 11 and 12.

C 12 and 13.

D 13 and 14.

M02666

25. The square of a whole number is between 1,500 and 1,600. The number must be between

A 30 and 35.

B 35 and 40.

C 40 and 45.

D 45 and 50.

M00313

**Number Sense**

26. If  $|x| = 3$ , what is the value of  $x$ ?

- A -3 or 0
- B -3 or 3
- C 0 or 3
- D -9 or 9

M02122

27. What is the absolute value of  $-4$ ?

- A  $-4$
- B  $-\frac{1}{4}$
- C  $\frac{1}{4}$
- D  $4$

M02667

*Number Sense*

Question Number	Correct Answer	Standard	Year of Exam
1	B	7NS1.1	2002
2	C	7NS1.1	2001
3	C	7NS1.2	2002
4	A	7NS1.2	2002
5	A	7NS1.2	2001
6	D	7NS1.2	2001
7	B	7NS1.2	2004
8	C	7NS1.3	2002
9	B	7NS1.3	2001
10	C	7NS1.6	2002
11	B	7NS1.6	2001
12	C	7NS1.7	2002
13	B	7NS1.7	2001
14	C	7NS1.7	2001
15	C	7NS1.7	2004
16	C	7NS2.1	2003
17	C	7NS2.1	2002
18	C	7NS2.1	2004
19	D	7NS2.2	2003
20	B	7NS2.2	2001
21	C	7NS2.2	2004
22	D	7NS2.3	2002
23	A	7NS2.3	2001
24	C	7NS2.4	2002
25	B	7NS2.4	2001
26	B	7NS2.5	2002
27	D	7NS2.5	2001

## STATISTICS, DATA ANALYSIS, AND PROBABILITY

The following seven California mathematics academic content standards from the Statistics, Data Analysis, and Probability strand are assessed on the CAHSEE by 12 test questions and are represented in this booklet by 20 released test questions. These questions represent only a few of the ways in which these standards may be assessed on the CAHSEE.

### GRADE 6 — STATISTICS, DATA ANALYSIS, AND PROBABILITY

#### Standard Set 1.0 Students compute and analyze statistical measurements for data sets:

1.1 Compute the ~~range~~, mean, median, and mode of data sets.\*

#### Standard Set 2.0 Students use data samples of a population and describe the characteristics and limitations of the samples:

2.5 Identify claims based on statistical data and, in simple cases, evaluate the validity of the claims.

#### Standard Set 3.0 Students determine theoretical and experimental probabilities and use these to make predictions about events:

3.1 Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome.

3.3 Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 100 and verify that the probabilities computed are reasonable; know that if  $P$  is the probability of an event,  $1 - P$  is the probability of an event not occurring.

3.5 Understand the difference between independent and dependent events.

### GRADE 7 — STATISTICS, DATA ANALYSIS, AND PROBABILITY

#### Standard Set 1.0 Students collect, organize, and represent data sets that have one or more variables and identify relationships among variables within a data set by hand and through the use of an electronic spreadsheet software program:

1.1 Know various forms of display for data sets, ~~including a stem-and-leaf plot or box-and-whisker plot~~; use the forms to display a single set of data or to compare two sets of data.\*

1.2 Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level).

\* The crossed-out portion of this standard is not assessed on the CAHSEE, but is still included in grade-level standards.

*Statistics, Data Analysis, and Probability*

28. Donald priced six personal Compact Disc (CD) players. The prices are shown below.

\$21.00, \$23.00, \$21.00, \$39.00, \$25.00, \$31.00

What is the median price?

- A \$21.00
- B \$24.00
- C \$27.00
- D \$30.00

M02964

29. Rico's first three test scores in biology were 65, 90, and 73. What was his mean score?

- A 65
- B 73
- C 76
- D 90

M02247

30. The chart below shows the mathematics test scores of three students.

Mathematics Test Scores

	Test 1	Test 2	Test 3	Test 4
Parisa	7	8	10	6
Hector	6	7	9	10
Charles	8	10	10	9

What is Hector's mean score?

- A 6
- B 7
- C 8
- D 9

M00124

31. The box below shows the number of kilowatt-hours of electricity used last month at each of the houses on Harris Street.

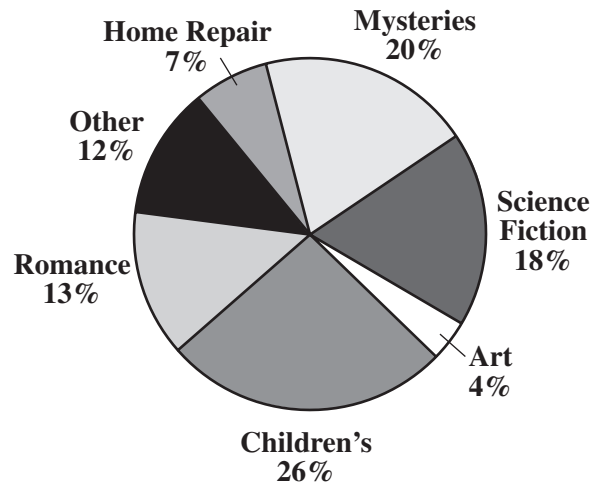
620, 570, 570, 590, 560, 640, 590, 590, 580

What is the mode of these data?

- A 560
- B 580
- C 590
- D 640

M12248

32. The Smithburg town library wanted to see what types of books were borrowed most often.



According to the circle graph shown above—

- A more Children's books were borrowed than Romance and Science Fiction combined.
- B more than half of the books borrowed were Children's, Mysteries, and Art combined.
- C more Mysteries were borrowed than Art and Science Fiction combined.
- D more than half of the books borrowed were Romance, Mysteries, and Science Fiction combined.

M02131

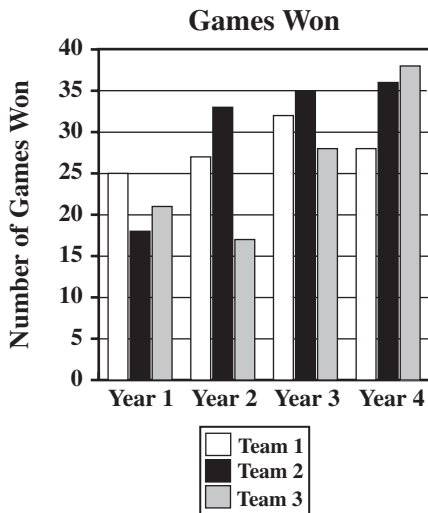
*Statistics, Data Analysis, and Probability*

33. Three-fourths of the 36 members of a club attended a meeting. Ten of those attending the meeting were female. Which one of the following questions can be answered with the information given?

- A How many males are in the club?
- B How many females are in the club?
- C How many male members of the club attended the meeting?
- D How many female members of the club did not attend the meeting?

M00261

34. The number of games won over four years for three teams is shown on the graph below.



Which statement is true based on this information?

- A Team 3 always came in second.
- B Team 1 had the best average overall.
- C Team 1 always won more games than Team 3.
- D Team 2 won more games each year than in the previous year.

M10300

35. To get home from work, Curtis must get on one of the three highways that leave the city. He then has a choice of four different roads that lead to his house. In the diagram below, each letter represents a highway, and each number represents a road.

		Highway		
		A	B	C
Road	1	A 1	B 1	C 1
	2	A 2	B 2	C 2
	3	A 3	B 3	C 3
	4	A 4	B 4	C 4

If Curtis randomly chooses a route to travel home, what is the probability that he will travel Highway B and Road 4?

- A  $\frac{1}{16}$
- B  $\frac{1}{12}$
- C  $\frac{1}{4}$
- D  $\frac{1}{3}$

M02512

**Statistics, Data Analysis, and Probability**

36. The table below shows all of the possible outcomes when flipping three fair coins at the same time.

First Coin	Second Coin	Third Coin
H	H	H
H	H	T
H	T	H
H	T	T
T	H	H
T	H	T
T	T	H
T	T	T

Which of the following statements must be true?

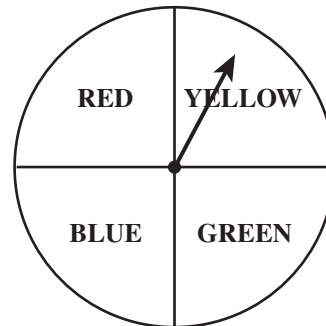
- A The probability that exactly two coins have the same outcome is  $\frac{1}{2}$ .
- B The probability of getting exactly one tail is higher than getting exactly two tails.
- C The probability of getting at least one head is higher than the probability of getting at least one tail.
- D The probability that all of the coins will land on heads is the same as the probability that all of the coins will land on tails.

M13243

37. A bucket contains 3 bottles of apple juice, 2 bottles of orange juice, 6 bottles of tomato juice, and 8 bottles of water. If Kira randomly selects a bottle, what is the probability that she will select a drink other than water?

- A  $\frac{3}{4}$
- B  $\frac{11}{19}$
- C  $\frac{8}{19}$
- D  $\frac{1}{4}$

M11379



38. The spinner shown above is fair. What is the probability that the spinner will not stop on red if you spin it one time?

- A  $\frac{1}{4}$
- B  $\frac{1}{3}$
- C  $\frac{3}{4}$
- D  $\frac{4}{3}$

M00094

*Statistics, Data Analysis, and Probability*

39. Mr. Gulati is holding five cards numbered 1 through 5. He has asked five students to each randomly pick a card to see who goes first in a game. Whoever picks the card numbered 5 goes first. Juanita picks first, gets the card numbered 4, and keeps the card. What is the probability that Yoko will get the card numbered 5 if she picks second?

- A  $\frac{1}{2}$   
 B  $\frac{1}{3}$   
 C  $\frac{1}{4}$   
 D  $\frac{1}{5}$

M02145

40. A bag contained four green balls, three red balls, and two purple balls. Jason removed one purple ball from the bag and did not put the ball back in the bag. He then randomly removed another ball from the bag. What is the probability that the second ball Jason removed was purple?

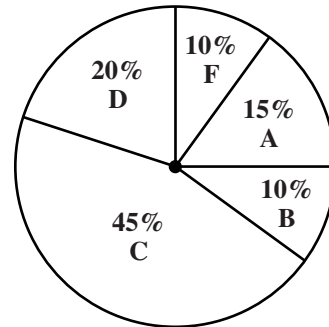
- A  $\frac{1}{36}$   
 B  $\frac{1}{9}$   
 C  $\frac{1}{8}$   
 D  $\frac{2}{9}$

M03097

41. Heather flipped a coin five times, and each time it came up heads. If Heather flips the coin one more time, what is the theoretical probability that it will come up tails?

- A  $\frac{1}{6}$   
 B  $\frac{1}{2}$   
 C  $\frac{3}{5}$   
 D  $\frac{5}{6}$

M02171



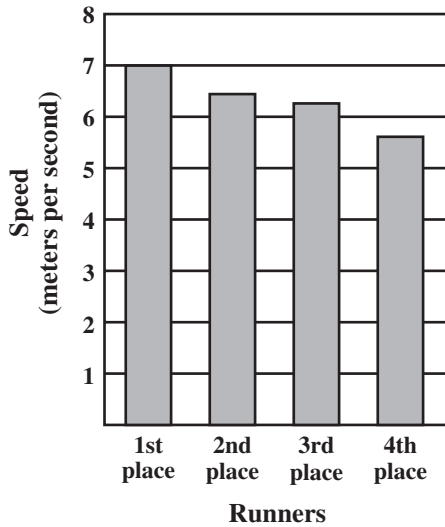
42. The circle graph shown above represents the distribution of the grades of 40 students in a certain geometry class. How many students received As or Bs?

- A 6  
 B 10  
 C 15  
 D 20

M00300

*Statistics, Data Analysis, and Probability*

**Speed of Four Runners  
in a 100-Meter Dash**

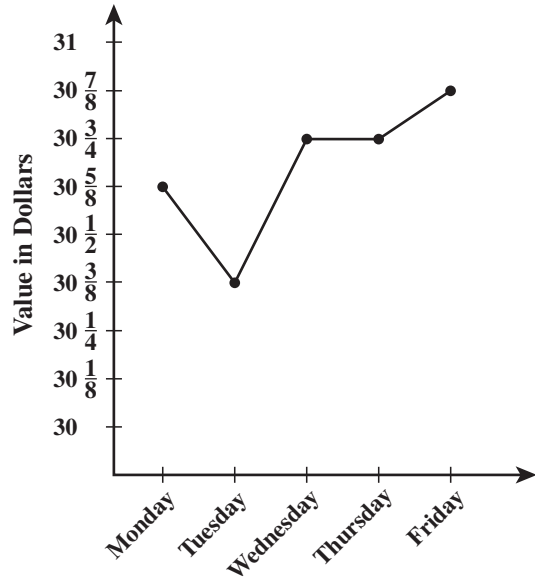


43. Based on the bar graph shown above, which of the following conclusions is true?

- A Everyone ran faster than 6 meters per second.
- B The best possible rate for the 100-meter dash is 5 meters per second.
- C The first-place runner was four times as fast as the fourth-place runner.
- D The second-place and third-place runners were closest in time to one another.

M00279

44. The graph below represents the closing price of a share of a certain stock for each day of a week.



Which day had the greatest increase in the value of this stock over that of the previous day?

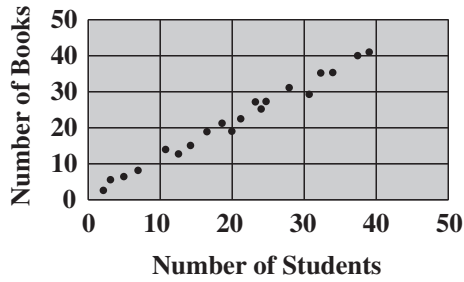
- A Tuesday
- B Wednesday
- C Thursday
- D Friday

M00295

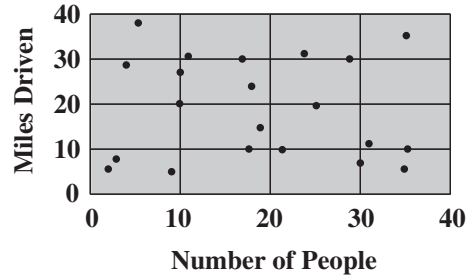
*Statistics, Data Analysis, and Probability*

45. Which scatterplot shows a negative correlation?

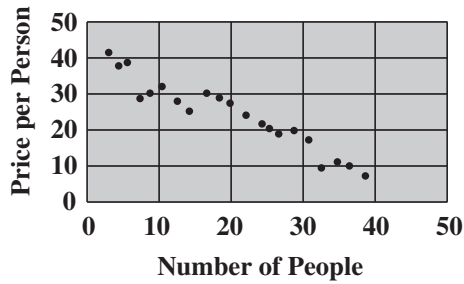
A



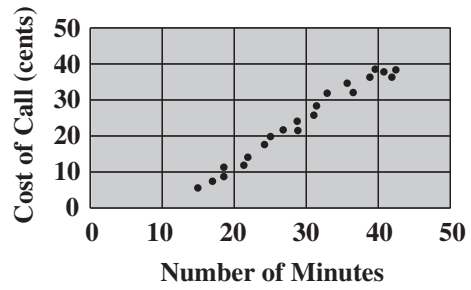
C



B

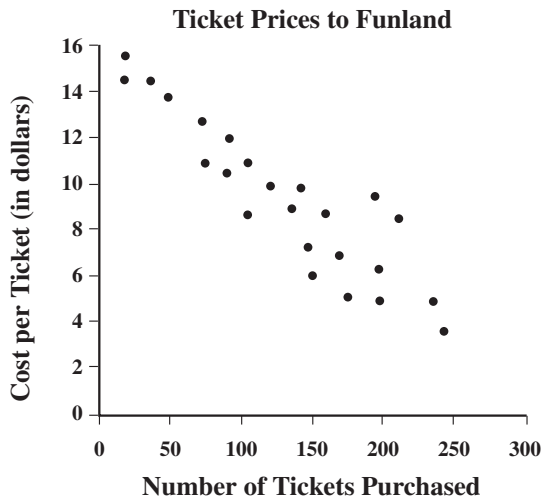


D



M02546

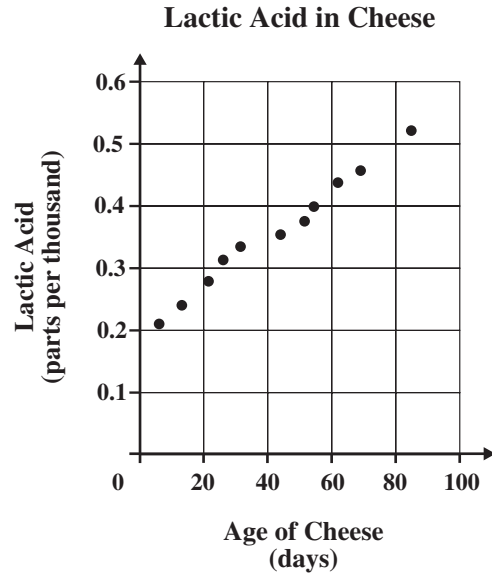
*Statistics, Data Analysis, and Probability*



46. The cost of a ticket to Funland varies according to the season. Which of the following conclusions about the number of tickets purchased and the cost per ticket is best supported by the scatterplot above?
- A The cost per ticket increases as the number of tickets purchased increases.
  - B The cost per ticket is unchanged as the number of tickets purchased increases.
  - C The cost per ticket decreases as the number of tickets purchased increases.
  - D There is no relationship between the cost per ticket and the number of tickets purchased.

M02208

47. The scatterplot below shows the time cheese has been aging and the amount of lactic acid present in the cheese.



Which statement is MOST strongly supported by the scatterplot?

- A The longer cheese ages, the more lactic acid is present.
- B The longer cheese ages, the less lactic acid is present.
- C The amount of lactic acid present remains constant as cheese ages.
- D No relationship exists between the time cheese ages and the amount of lactic acid present.

M22077

*Statistics, Data Analysis, and Probability*

Question Number	Correct Answer	Standard	Year of Exam
28	B	6PS1.1	2003
29	C	6PS1.1	2002
30	C	6PS1.1	2001
31	C	6PS1.1	2004
32	D	6PS2.5	2003
33	C	6PS2.5	2002
34	D	6PS2.5	2004
35	B	6PS3.1	2002
36	D	6PS3.1	2004
37	B	6PS3.3	2003
38	C	6PS3.3	2001
39	C	6PS3.5	2002
40	C	6PS3.5	2002
41	B	6PS3.5	2001
42	B	7PS1.1	2003
43	D	7PS1.1	2002
44	B	7PS1.1	2001
45	B	7PS1.2	2002
46	C	7PS1.2	2001
47	A	7PS1.2	2004

## ALGEBRA AND FUNCTIONS

The following ten California mathematics academic content standards from the Algebra and Functions strand are assessed on the CAHSEE by 17 test questions and are represented in this booklet by 26 released test questions. These questions represent only a few of the ways in which these standards may be assessed on the CAHSEE.

GRADE 7 — ALGEBRA AND FUNCTIONS	
<b>Standard Set 1.0</b>	<b>Students express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs:</b>
1.1	Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A).
1.2	Use the correct order of operations to evaluate algebraic expressions such as $3(2x + 5)^2$ .
1.5	Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.
<b>Standard Set 2.0</b>	<b>Students interpret and evaluate expressions involving integer powers and simple roots:</b>
2.1	Interpret positive whole-number powers as repeated multiplication and negative whole-number powers as repeated division or multiplication by the multiplicative inverse. Simplify and evaluate expressions that include exponents.
2.2	Multiply and divide monomials; extend the process of taking powers and extracting roots to monomials when the latter results in a monomial with an integer exponent.
<b>Standard Set 3.0</b>	<b>Students graph and interpret linear and some nonlinear functions:</b>
3.1	Graph functions of the form $y = nx^2$ and $y = nx^3$ and use in solving problems.
3.3	Graph linear functions, noting that the vertical change (change in $y$ -value) per unit of horizontal change (change in $x$ -value) is always the same and know that the ratio ("rise over run") is called the slope of a graph.
3.4	Plot the values of quantities whose ratios are always the same (e.g., cost to the number of an item, feet to inches, circumference to diameter of a circle). Fit a line to the plot and understand that the slope of the line equals the quantities.
<b>Standard Set 4.0</b>	<b>Students solve simple linear equations and inequalities over the rational numbers:</b>
4.1	Solve two-step linear equations and inequalities in one variable over the rational numbers, interpret the solution or solutions in the context from which they arose, and verify the reasonableness of the results.
4.2	Solve multistep problems involving rate, average speed, distance, and time or a direct variation.

*Algebra and Functions*

48. Which of the following inequalities represents the statement, "A number,  $x$ , decreased by 13 is less than or equal to 39"?

A  $13 - x \geq 39$   
 B  $13 - x \leq 39$   
 C  $x - 13 \leq 39$   
 D  $x - 13 < 39$

M03049

51. In a certain room, the number of chairs,  $c$ , is equal to 3 times the number of tables,  $t$ .

Which equation matches the information?

A  $3 \cdot c = t$   
 B  $3 \cdot t = c$   
 C  $3 \cdot c = 3 \cdot t$   
 D  $c \cdot t = 3$

M00104

49. A shopkeeper has  $x$  kilograms of tea in stock. He sells 15 kilograms and then receives a new shipment weighing  $2y$  kilograms. Which expression represents the weight of the tea he now has?

A  $x - 15 - 2y$   
 B  $x + 15 + 2y$   
 C  $x + 15 - 2y$   
 D  $x - 15 + 2y$

M00110

52. If  $n = 2$  and  $x = \frac{1}{2}$ , then  $n(4 - x) =$

A 1  
 B 3  
 C 7  
 D 10

M00034

50. Divide a number by 5 and add 4 to the result. The answer is 9.

Which of the following equations matches these statements?

A  $4 = 9 + \frac{n}{5}$   
 B  $\frac{n}{5} + 4 = 9$   
 C  $\frac{5}{n} = 4$   
 D  $\frac{n + 4}{5} = 9$

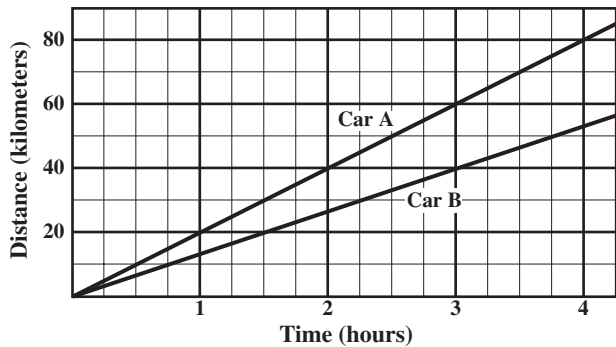
M00050

53. If  $h = 3$  and  $k = 4$ , then  $\frac{hk + 4}{2} - 2 =$

A 6  
 B 7  
 C 8  
 D 10

M00052

*Algebra and Functions*

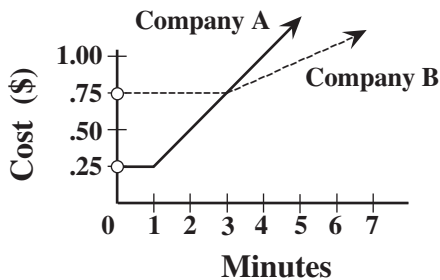


54. After three hours of travel, Car A is about how many kilometers ahead of Car B?

- A 2
- B 10
- C 20
- D 25

M00066

55. The cost of a long distance call charged by each of two telephone companies is shown on the graph below.



Company A is less expensive than Company B for

- A all calls.
- B 3 minute calls only.
- C calls less than 3 minutes.
- D calls longer than 3 minutes.

M02840

56.  $x^3y^3 =$

- A  $9xy$
- B  $(xy)^6$
- C  $3xy$
- D  $xxxxyyy$

M02879

57. What does  $x^5$  equal when  $x = -2$ ?

- A  $-32$
- B  $-10$
- C  $-\frac{1}{32}$
- D  $32$

M12857

58.  $\sqrt{4x^4} =$

- A 2
- B  $2x$
- C  $4x$
- D  $2x^2$

M03067

**Algebra and Functions**

59. Simplify the expression shown below.

$$(5x^2z^2)(8xz^3)$$

- A  $40x^2z^6$
- B  $40x^3z^5$
- C  $40x^3z^6$
- D  $40x^5z^5$

M02009

60. Simplify the expression shown below.

$$(6a^4bc)(7ab^3c)$$

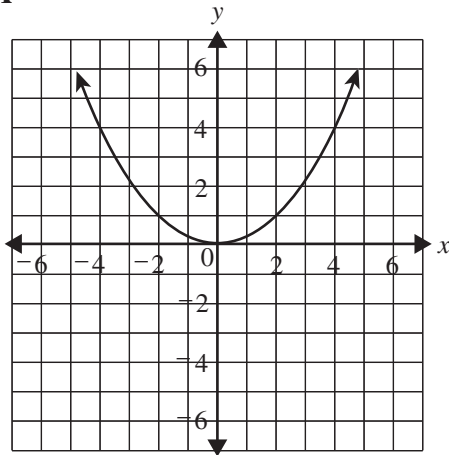
- A  $13a^4b^3c$
- B  $13a^5b^4c^2$
- C  $42a^4b^3c$
- D  $42a^5b^4c^2$

M02109

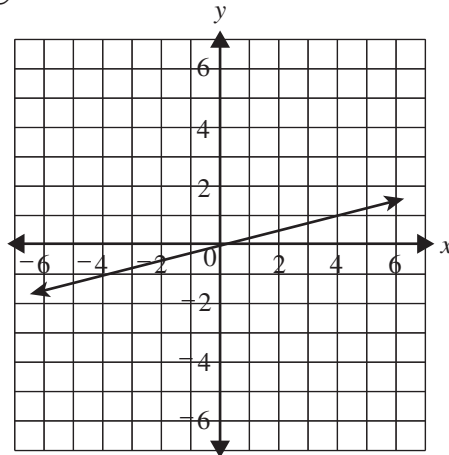
*Algebra and Functions*

61. Which of the following is the graph of  $y = \frac{1}{4}x^2$ ?

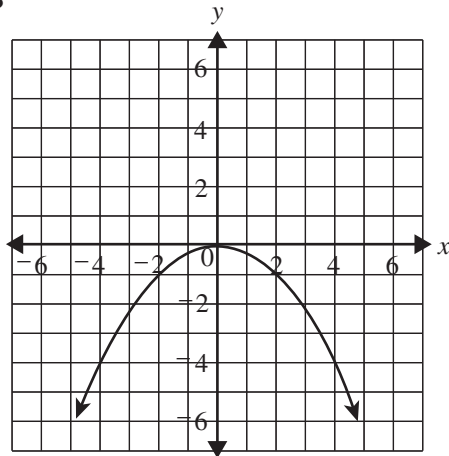
A



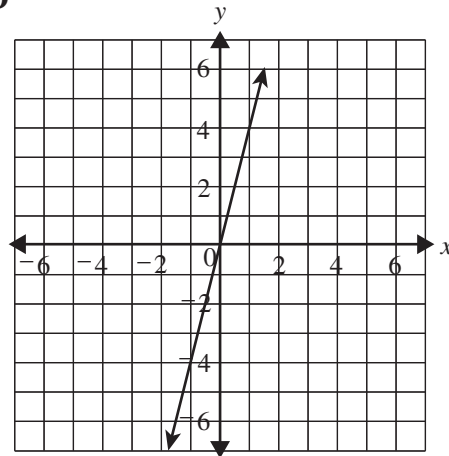
C



B



D

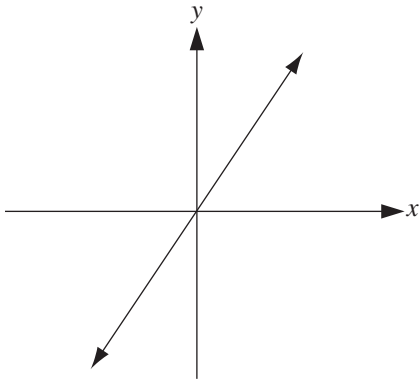


M03210

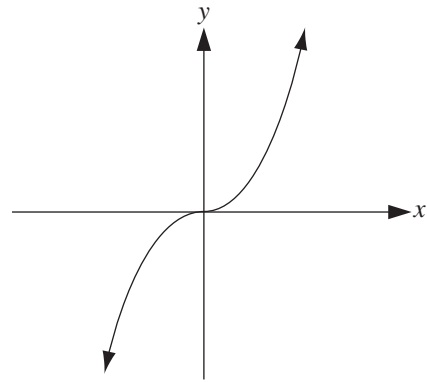
*Algebra and Functions*

62. Which of the following could be the graph of  $y = x^3$ ?

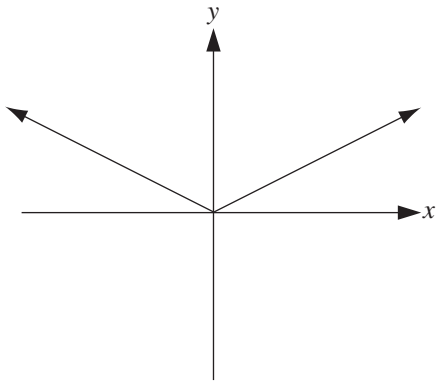
A



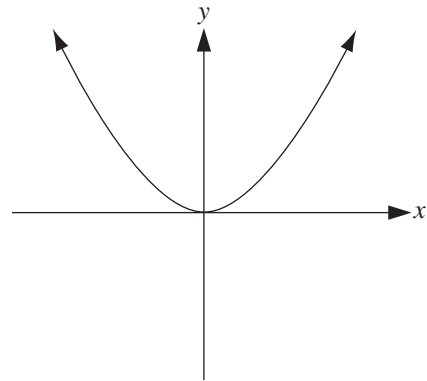
C



B

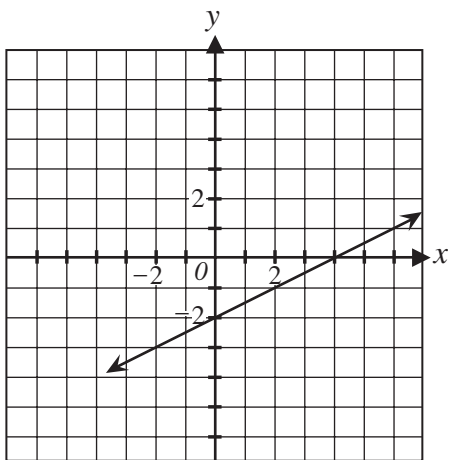


D



M02200

*Algebra and Functions*

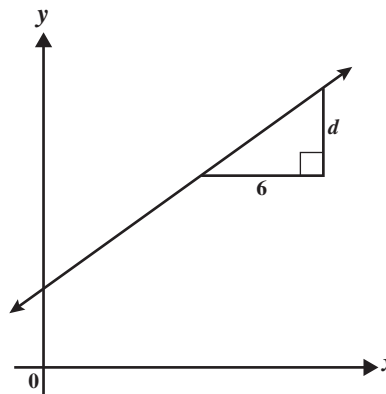


63. What is the slope of the line shown in the graph above?

- A -2
- B  $-\frac{1}{2}$
- C  $\frac{1}{2}$
- D 2

M02556

64. The slope of the line shown below is  $\frac{2}{3}$ .



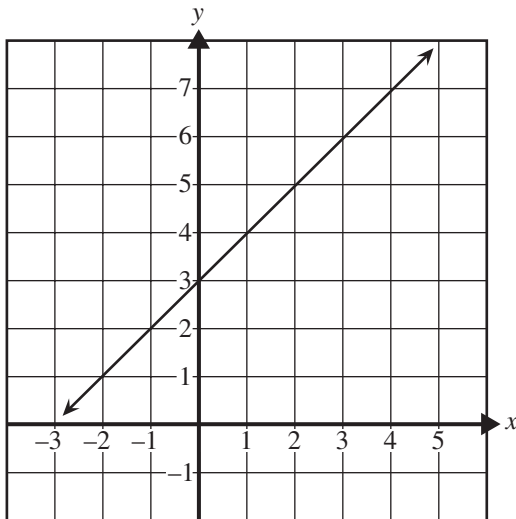
What is the value of  $d$ ?

- A 3
- B 4
- C 6
- D 9

M02078

*Algebra and Functions*

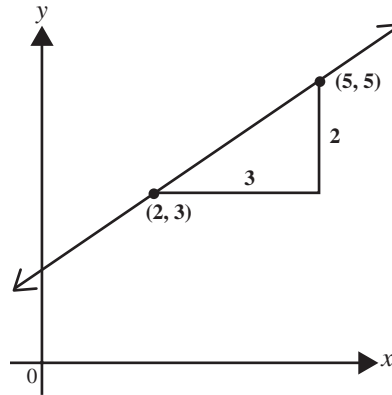
65. What is the equation of the graph shown below?



- A  $y = x - 1$
- B  $y = x + 1$
- C  $y = x + 3$
- D  $y = x - 3$

M02035

66. What is the slope of the line below?

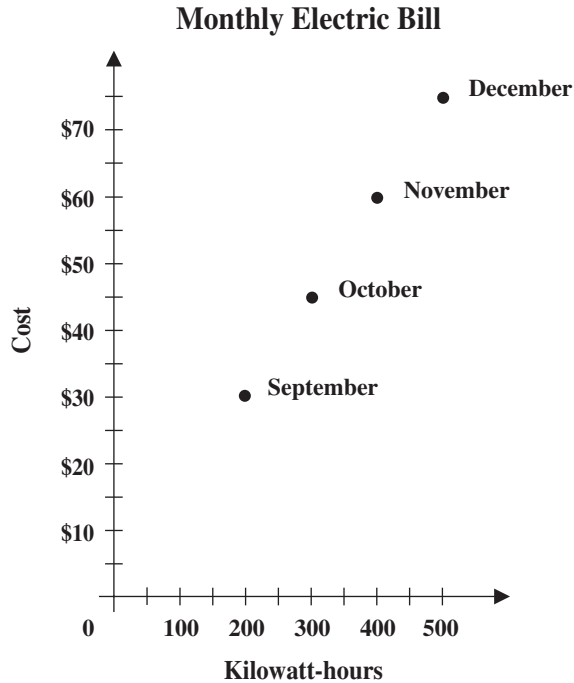


- A  $-\frac{3}{2}$
- B  $-\frac{2}{3}$
- C  $\frac{2}{3}$
- D  $\frac{3}{2}$

M02077

## Algebra and Functions

67. The graph below shows Francine's electric bill for 4 different months. What is the price per kilowatt-hour of Francine's electricity?



- A \$0.15  
 B \$0.30  
 C \$1.50  
 D \$6.67

M02681

68. In the inequality  $2x + \$10,000 \geq \$70,000$ ,  $x$  represents the salary of an employee in a school district. Which phrase most accurately describes the employee's salary?

- A At least \$30,000  
 B At most \$30,000  
 C Less than \$30,000  
 D More than \$30,000

M02621

69. Solve for  $x$ .

$$2x - 3 = 7$$

- A -5  
 B -2  
 C 2  
 D 5

M02771

*Algebra and Functions*

70. Solve for  $n$ .

$$2n + 3 < 17$$

- A  $n < 2$
- B  $n < 3$
- C  $n < 5$
- D  $n < 7$

M02040

71. The owner of an apple orchard ships apples in boxes that weigh 2 kilograms (kg) when empty. The average apple weighs 0.25 kg, and the total weight of a box filled with apples is 12 kg. How many apples are packed in each box?

- A 14
- B 40
- C 48
- D 56

M10327

72. Stephanie is reading a 456-page book. During the past 7 days she has read 168 pages. If she continues reading at the same rate, how many more days will it take her to complete the book?

- A 12
- B 14
- C 19
- D 24

M00380

73. Robert's toy car travels at 40 centimeters per second (cm/sec) at high speed and 15 cm/sec at low speed. If the car travels for 15 seconds at high speed and then 30 seconds at low speed, what distance would the car have traveled?

- A 1050 cm
- B 1200 cm
- C 1425 cm
- D 2475 cm

M10748

*Algebra and Functions*

Question Number	Correct Answer	Standard	Year of Exam
48	C	7AF1.1	2002
49	D	7AF1.1	2002
50	B	7AF1.1	2001
51	B	7AF1.1	2001
52	C	7AF1.2	2003
53	A	7AF1.2	2001
54	C	7AF1.5	2002
55	C	7AF1.5	2001
56	D	7AF2.1	2002
57	A	7AF2.1	2004
58	D	7AF2.2	2002
59	B	7AF2.2	2001
60	D	7AF2.2	2001
61	A	7AF3.1	2003
62	C	7AF3.1	2001
63	C	7AF3.3	2002
64	B	7AF3.3	2002
65	C	7AF3.3	2001
66	C	7AF3.3	2001
67	A	7AF3.4	2004
68	A	7AF4.1	2002
69	D	7AF4.1	2002
70	D	7AF4.1	2001
71	B	7AF4.1	2004
72	A	7AF4.2	2002
73	A	7AF4.2	2004

## MEASUREMENT AND GEOMETRY

The following ten California mathematics academic content standards from the Measurement and Geometry strand are assessed on the CAHSEE by 17 test questions and are represented in this booklet by 30 released test questions. These questions represent only a few of the ways in which these standards may be assessed on the CAHSEE.

GRADE 7 — MEASUREMENT AND GEOMETRY	
<b>Standard Set 1.0</b>	<b>Students choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems:</b>
1.1	Compare weights, capacities, geometric measures, times, and temperatures within and between measurement systems (e.g., miles per hour and feet per second, cubic inches to cubic centimeters).
1.2	Construct and read drawings and models made to scale.
1.3	Use measures expressed as rates (e.g., speed, density) and measures expressed as products (e.g., person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer.
<b>Standard Set 2.0</b>	<b>Students compute the perimeter, area, and volume of common geometric objects and use the results to find measures of less common objects. They know how perimeter, area and volume are affected by changes of scale:</b>
2.1	Use formulas routinely for finding the perimeter and area of basic two-dimensional figures and the surface area and volume of basic three-dimensional figures, including rectangles, parallelograms, trapezoids, squares, triangles, circles, prisms, and cylinders.
2.2	Estimate and compute the area of more complex or irregular two- and three-dimensional figures by breaking the figures down into more basic geometric objects.
2.3	Compute the length of the perimeter, the surface area of the faces, and the volume of a three-dimensional object built from rectangular solids. Understand that when the lengths of all dimensions are multiplied by a scale factor, the surface area is multiplied by the square of the scale factor and volume is multiplied by the cube of the scale factor.
2.4	Relate the changes in measurement with a change of scale to the units used (e.g., square inches, cubic feet) and to conversions between units (1 square foot = 144 square inches or $[1 \text{ ft}^2] = [144 \text{ in}^2]$ , 1 cubic inch is approximately 16.38 cubic centimeters or $[1 \text{ in}^3] = [16.38 \text{ cm}^3]$ ).

## Measurement and Geometry

**Standard Set 3.0** Students know the Pythagorean theorem and deepen their understanding of plane and solid geometric shapes by constructing figures that meet given conditions and by identifying attributes of figures:

- |     |  |
|-----|--|
| 3.2 | Understand and use coordinate graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections.  |
| 3.3 | Know and understand the Pythagorean theorem and its converse and use it to find the length of the missing side of a right triangle and the lengths of other line segments and, in some situations, empirically verify the Pythagorean theorem by direct measurement. |
| 3.4 | Demonstrate an understanding of conditions that indicate two geometrical figures are congruent and what congruence means about the relationships between the sides and angles of the two figures.  |

74. One millimeter is—

- A  $\frac{1}{1000}$  of a meter.  
 B  $\frac{1}{100}$  of a meter.  
 C 100 meters.  
 D 1000 meters.

M00276

75. A boy is two meters tall. About how tall is the boy in feet (ft) and inches (in.)? (1 meter  $\approx$  39 inches.)

- A 5 ft 0 in.  
 B 5 ft 6 in.  
 C 6 ft 0 in.  
 D 6 ft 6 in.

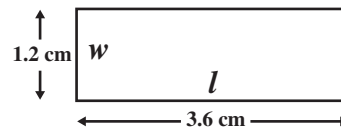
M02044

76. Juanita exercised for one hour. How many seconds did Juanita exercise?

- A 60  
 B 120  
 C 360  
 D 3,600

M03074

77. The actual width ( $w$ ) of a rectangle is 18 centimeters (cm). Use the scale drawing of the rectangle to find the actual length ( $l$ ).

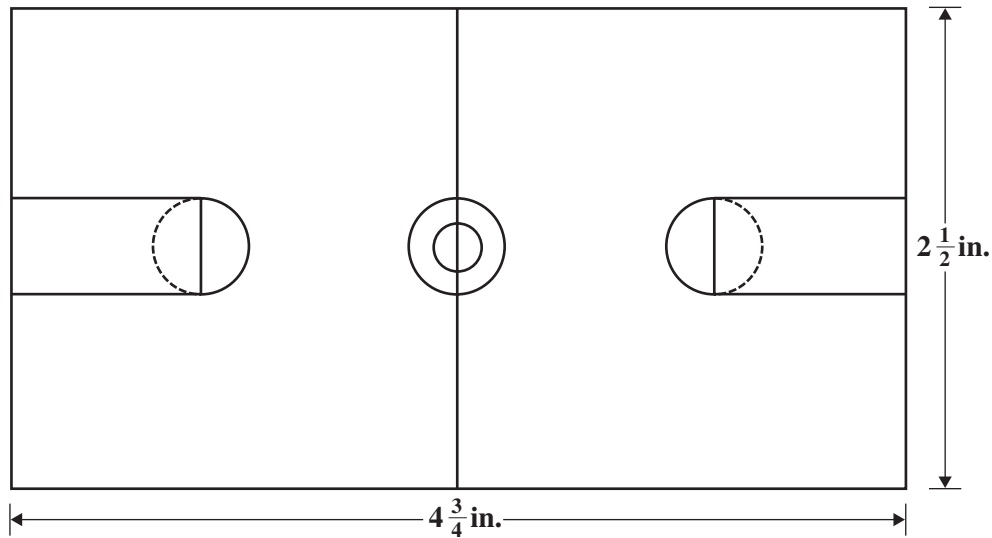


- A 6 cm  
 B 24 cm  
 C 36 cm  
 D 54 cm

M02087

*Measurement and Geometry*

78. The scale drawing of the basketball court shown below is drawn using a scale of 1 inch (in.) = 24 feet (ft).



What is the length, in feet, of the basketball court?

- A 90 ft
- B 104 ft
- C 114 ft
- D 120 ft

M02233

## Measurement and Geometry

79. Sixty miles per hour is the same rate as which of the following?

- A 1 mile per minute
- B 1 mile per second
- C 6 miles per minute
- D 360 miles per second

M02473

80. Beverly ran six miles at the speed of four miles per hour. How long did it take her to run that distance?

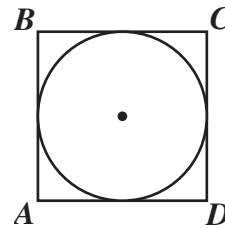
- A  $\frac{2}{3}$  hr
- B  $1\frac{1}{2}$  hrs
- C 4 hrs
- D 6 hrs

M02041

81. Marcus can type about 42 words per minute. If he types at this rate for 30 minutes without stopping, about how many words will he type?

- A 1260
- B 2100
- C 2520
- D 4200

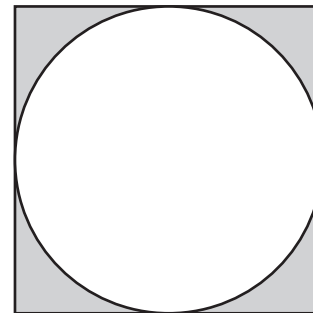
M21029



82. In the figure above, the radius of the inscribed circle is 6 inches (in.). What is the perimeter of square  $ABCD$ ?

- A  $12\pi$  in.
- B  $36\pi$  in.
- C 24 in.
- D 48 in.

M02236



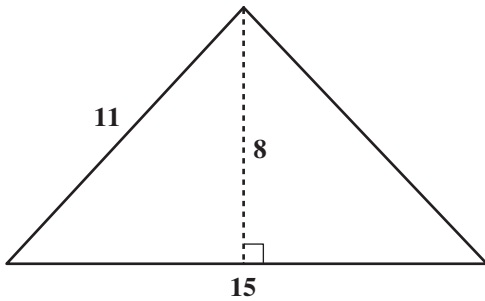
10 feet

83. The largest possible circle is to be cut from a 10-foot square board. What will be the approximate area, in square feet, of the remaining board (shaded region)?  
( $A = \pi r^2$  and  $\pi \approx 3.14$ )

- A 20
- B 30
- C 50
- D 80

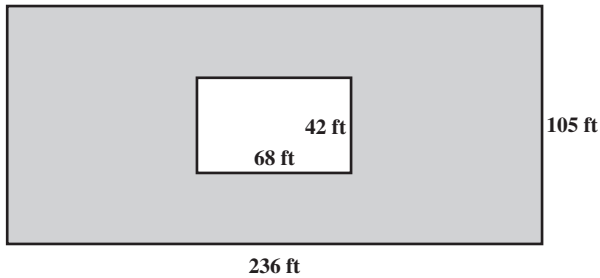
M00404

*Measurement and Geometry*



84. What is the area of the triangle shown above?
- A 44 square units
  - B 60 square units
  - C 88 square units
  - D 120 square units

M00101



85. A rectangular pool 42 feet by 68 feet is on a rectangular lot 105 feet by 236 feet. The rest of the lot is grass. Approximately how many square feet is grass?
- A 2,100
  - B 2,800
  - C 21,000
  - D 28,000

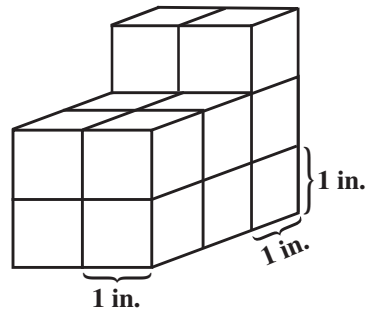
M00311



86. What is the volume of the shoebox shown above in cubic inches ( $\text{in.}^3$ )?
- A 29
  - B 75
  - C 510
  - D 675

M02629

87. One-inch cubes are stacked as shown in the drawing below.

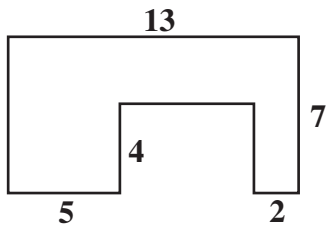


What is the total surface area?

- A  $19\text{in.}^2$
- B  $29\text{in.}^2$
- C  $32\text{in.}^2$
- D  $38\text{in.}^2$

M02812

*Measurement and Geometry*

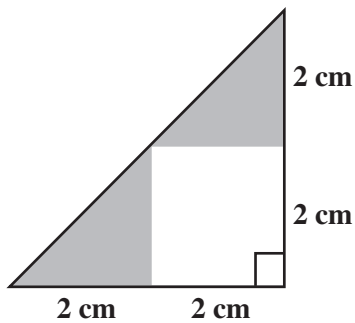


88. In the figure shown above, all the corners form right angles. What is the area of the figure in square units?

- A 67
- B 73
- C 78
- D 91

M00318

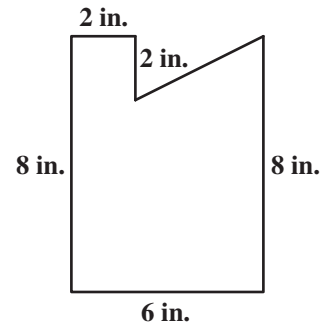
89. What is the area of the shaded region in the figure shown below?



- A  $4 \text{ cm}^2$
- B  $6 \text{ cm}^2$
- C  $8 \text{ cm}^2$
- D  $16 \text{ cm}^2$

M02814

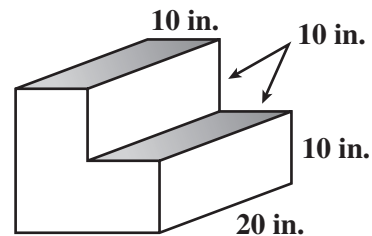
90. A right triangle is removed from a rectangle as shown in the figure below. Find the area of the remaining part of the rectangle.



- A  $40 \text{ in.}^2$
- B  $44 \text{ in.}^2$
- C  $48 \text{ in.}^2$
- D  $52 \text{ in.}^2$

M02093

91. The short stairway shown below is made of solid concrete. The height and width of each step is 10 inches (in.). The length is 20 inches.

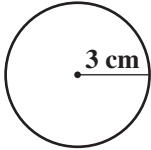
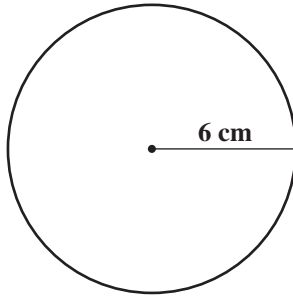


What is the volume, in cubic inches, of the concrete used to create this stairway?

- A 3000
- B 4000
- C 6000
- D 8000

M02990

## Measurement and Geometry

Circle  $x$ Circle  $y$ 

92. The two circles shown above have radii of 3 cm and 6 cm.

What is  $\frac{\text{Circumference of Circle } x}{\text{Circumference of Circle } y}$ ?

- A  $\frac{1}{4}$   
 B  $\frac{1}{2}$   
 C  $\frac{\pi}{4}$   
 D  $\frac{\pi}{2}$

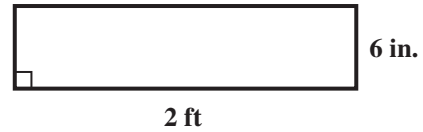
M02217

93. Bonni has two similar rectangular boxes. The dimensions of box 1 are twice those of box 2. How many times greater is the volume of box 1 than the volume of box 2?

- A 3  
 B 6  
 C 8  
 D 9

M21061

94. The width of the rectangle shown below is 6 inches (in.). The length is 2 feet (ft).



What is the area of the rectangle in square inches?

- A 12  
 B 16  
 C 60  
 D 144

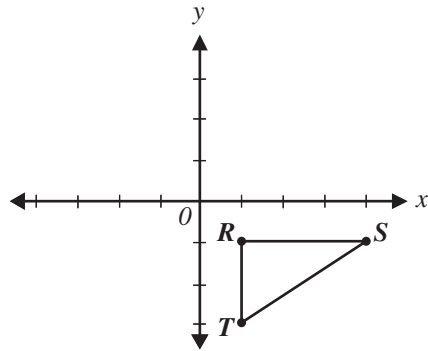
M03243

95. One cubic inch is approximately equal to 16.38 cubic centimeters. Approximately how many cubic centimeters are there in 3 cubic inches?

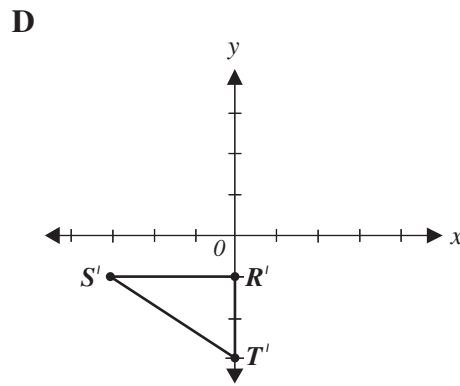
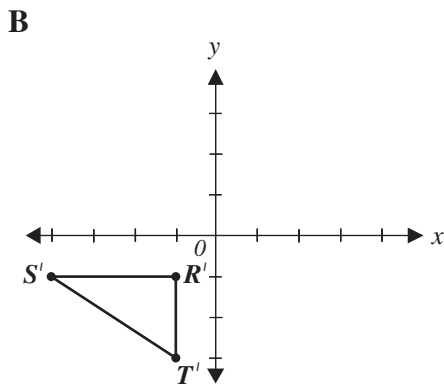
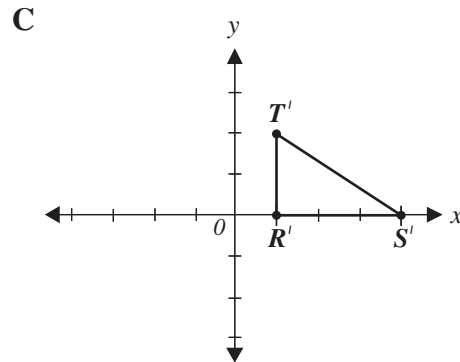
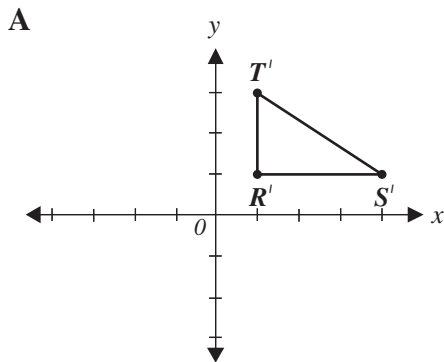
- A 5.46  
 B 13.38  
 C 19.38  
 D 49.14

M02700

*Measurement and Geometry*



96. Which of the following triangles  $R'S'T'$  is the image of triangle  $RST$  that results from reflecting triangle  $RST$  across the  $y$ -axis?



M02861

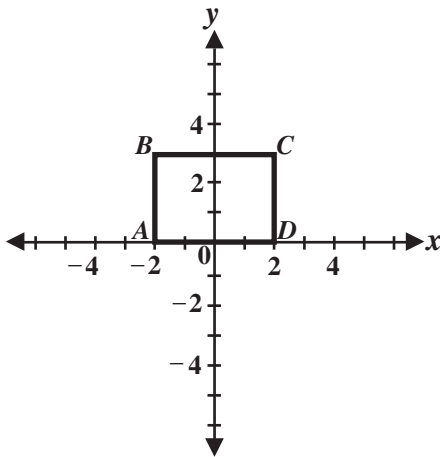
*Measurement and Geometry*

97. The points (1, 1), (2, 3), (4, 3), and (5, 1) are the vertices of a polygon. What type of polygon is formed by these points?

- A Triangle
- B Trapezoid
- C Parallelogram
- D Pentagon

M02718

98. The graph of rectangle  $ABCD$  is shown below.

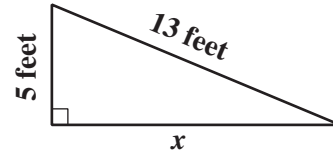


What is the area, in square units, of rectangle  $ABCD$ ?

- A 6
- B 10
- C 12
- D 14

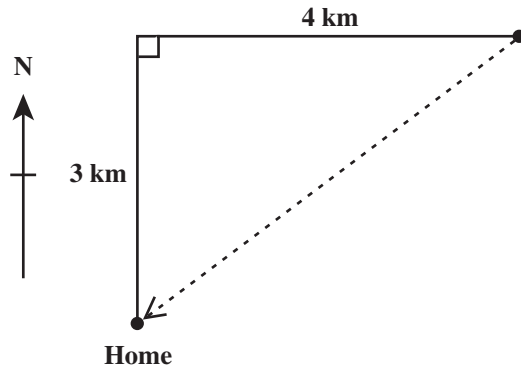
M03136

99. What is the value of  $x$  in the right triangle shown below?



- A 8 feet
- B 12 feet
- C 18 feet
- D 23 feet

M03181

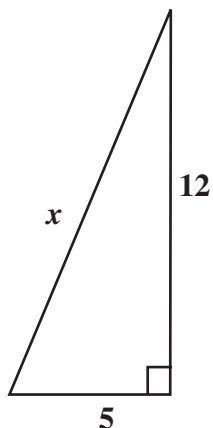


100. The club members hiked 3 kilometers north and 4 kilometers east, but then went directly home as shown by the dotted line. How far did they travel to get home?

- A 4 km
- B 5 km
- C 6 km
- D 7 km

M00120

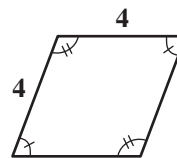
*Measurement and Geometry*



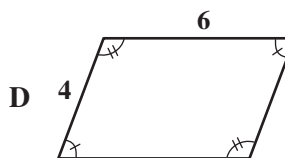
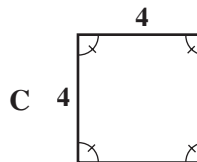
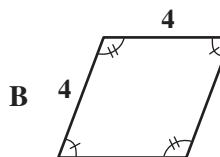
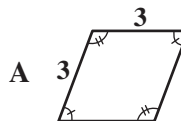
101. What is the value of  $x$  in the triangle shown above?

- A 11
- B 13
- C 17
- D 169

M02446



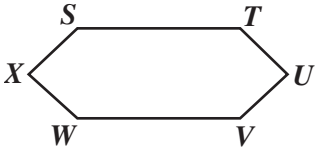
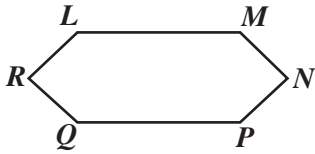
102. Which figure is congruent to the figure shown above?



M00020

## Measurement and Geometry

103. In the diagram below, hexagon  $LMNPQR$  is congruent to hexagon  $STUVWX$ .



Which side is the same length as  $\overline{MN}$ ?

- A  $\overline{NP}$
- B  $\overline{TU}$
- C  $\overline{UV}$
- D  $\overline{WX}$

M13069

*Measurement and Geometry*

Question Number	Correct Answer	Standard	Year of Exam
74	A	7MG1.1	2003
75	D	7MG1.1	2002
76	D	7MG1.1	2002
77	D	7MG1.2	2002
78	C	7MG1.2	2001
79	A	7MG1.3	2002
80	B	7MG1.3	2002
81	A	7MG1.3	2004
82	D	7MG2.1	2002
83	A	7MG2.1	2001
84	B	7MG2.1	2001
85	C	7MG2.1	2001
86	D	7MG2.1	2001
87	D	7MG2.2	2002
88	A	7MG2.2	2002
89	A	7MG2.2	2001
90	B	7MG2.2	2001
91	C	7MG2.3	2003
92	B	7MG2.3	2001
93	C	7MG2.3	2004
94	D	7MG2.4	2003
95	D	7MG2.4	2001
96	B	7MG3.2	2001
97	B	7MG3.2	2001
98	C	7MG3.2	2004
99	B	7MG3.3	2003
100	B	7MG3.3	2002
101	B	7MG3.3	2001
102	B	7MG3.4	2002
103	B	7MG3.4	2004

## MATHEMATICAL REASONING

The following six California mathematics academic content standards from the Mathematical Reasoning strand are assessed on the CAHSEE by 8 test questions and are represented in this booklet by 14 released test questions. These questions represent only a few of the ways in which these standards may be assessed on the CAHSEE.

NOTE: Each question in this strand also addresses a standard in one of the other five strands and is classified by that strand for purposes of reporting student scores. For example, the first question in the following set is classified as 7MR1.1 and also 7MG1.3.

GRADE 7 — MATHEMATICAL REASONING	
<b>Standard Set 1.0</b>	<b>Students make decisions about how to approach problems:</b>
1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.
1.2	Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.
<b>Standard Set 2.0</b>	<b>Students use strategies, skills, and concepts in finding solutions:</b>
2.1	Use estimation to verify the reasonableness of calculated results.
2.3	Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.
2.4	Make and test conjectures by using both inductive and deductive reasoning.
<b>Standard Set 3.0</b>	<b>Students determine a solution is complete and move beyond a particular problem by generalizing to other situations:</b>
3.3	Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.

**Mathematical Reasoning**

104. Chris drove 100 kilometers from San Francisco to Santa Cruz in 2 hours and 30 minutes. What computation will give Chris' average speed, in kilometers per hour?

- A Divide 100 by 2.5.
- B Divide 100 by 2.3.
- C Multiply 100 by 2.5.
- D Multiply 100 by 2.3.

M03164

A flower shop delivery van traveled these distances during one week: 104.4, 117.8, 92.3, 168.7, and 225.6 miles. How many gallons of gas were used by the delivery van during this week?

105. What other information is needed in order to solve this problem?

- A The average speed traveled in miles per hour
- B The cost of gasoline per gallon
- C The average number of miles per gallon for the van
- D The number of different deliveries the van made

M00138

106. If  $n$  is any odd number, which of the following is true about  $n + 1$ ?

- A It is an odd number.
- B It is an even number.
- C It is a prime number.
- D It is the same number as  $n - 1$ .

M00155

107. The table below shows the flight times from San Francisco (S.F.) to New York (N.Y.).

Leave S.F. Time	Arrive N.Y. Time
8:30 A.M.	4:50 P.M.
12:00 noon	8:25 P.M.
3:30 P.M.	11:40 P.M.
9:45 P.M.	5:50 A.M.

Which flight takes the longest?

- A The flight leaving at 8:30 A.M.
- B The flight leaving at 12:00 noon
- C The flight leaving at 3:30 P.M.
- D The flight leaving at 9:45 P.M.

M00376

108. If  $a$  is a positive number and  $b$  is a negative number, which expression is always positive?

- A  $a - b$
- B  $a + b$
- C  $a \times b$
- D  $a \div b$

M10683

## Mathematical Reasoning

109. The table below shows the number of visitors to a natural history museum during a 4-day period.

Day	Number of Visitors
Friday	597
Saturday	1115
Sunday	1346
Monday	365

Which expression would give the BEST estimate of the total number of visitors during this period?

- A  $500 + 1100 + 1300 + 300$
- B  $600 + 1100 + 1300 + 300$
- C  $600 + 1100 + 1300 + 400$
- D  $600 + 1100 + 1400 + 400$

M11112

110. Which is the best estimate of  $326 \times 279$ ?

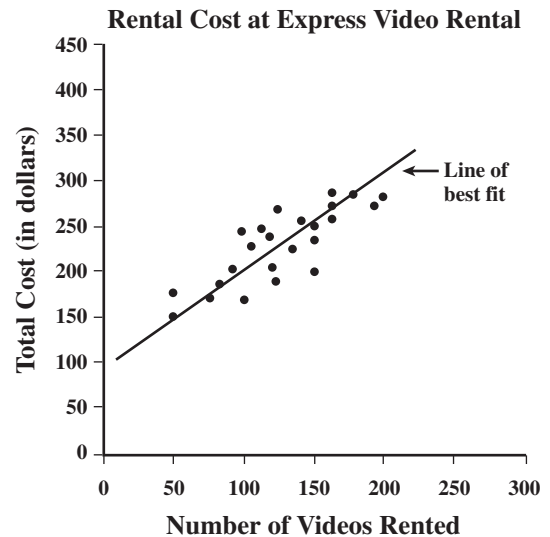
- A 900
- B 9,000
- C 90,000
- D 900,000

M00277

111. Marcus plans to buy a CD that has a regular price of \$13.99. It is on sale for 10% off, but Marcus will have to pay 7% sales tax. Which is the MOST reasonable estimate of the total cost of the CD including tax?

- A \$12.50
- B \$13.50
- C \$14.50
- D \$15.50

M11869



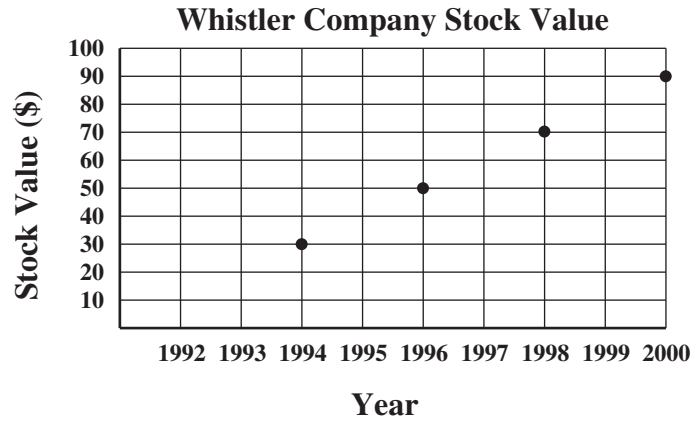
112. Using the line of best fit shown on the scatterplot above, which of the following best approximates the rental cost per video to rent 300 videos?

- A \$3.00
- B \$2.50
- C \$2.00
- D \$1.50

M02209

**Mathematical Reasoning**

113. The graph below shows the value of Whistler Company stock at the end of every other year from 1994 to 2000.



From this graph, which of the following was the most probable value of Whistler Company stock at the end of 1992?

- A -\$10
- B \$1
- C \$10
- D \$20

M02898

## Mathematical Reasoning

114. The table below shows values for  $x$  and corresponding values for  $y$ .

$x$	$y$
21	3
14	2
28	4
7	1

Which of the following represents the relationship between  $x$  and  $y$ ?

- A  $y = \frac{1}{7}x$
- B  $y = 7x$
- C  $y = x - 6$
- D  $y = x - 18$

M00377

115. The winning number in a contest was less than 50. It was a multiple of 3, 5, and 6. What was the number?

- A 14
- B 15
- C 30
- D It cannot be determined.

M00393

116. Lia used the following process to find the slope of the line described by the equation  $3y + 5x = 12$ .

Step 1: Subtract  $5x$  from each side.  $3y = -5x + 12$

Step 2: Divide each side by 3.  $y = -\frac{5}{3}x + 4$

Step 3: The slope of  $y = mx + b$  is  $m$ . Slope is  $-\frac{5}{3}$

According to Lia's method, which expression gives the slope of the line described by the equation  $ax + by = c$ ?

- A  $-\frac{a}{b}$
- B  $\frac{a}{b}$
- C  $-\frac{b}{a}$
- D  $\frac{b}{a}$

M11892

*Mathematical Reasoning*

**Len runs a mile in 8 minutes. At this rate how long will it take him to run a 26-mile marathon?**

**117. Which of the following problems can be solved using the same arithmetic operations that are used to solve the problem above?**

- A** Len runs 26 miles in 220 minutes. How long does it take him to run each mile?
- B** A librarian has 356 books to place on 18 shelves. Each shelf will contain the same number of books. How many books can the librarian place on each shelf?
- C** A cracker box weighs 200 grams. What is the weight of 100 boxes?
- D** Each basket of strawberries weighs 60 grams. How many baskets can be filled from 500 grams of strawberries?

M00137

Question Number	Correct Answer	Standard 1	Standard 2	Year of Exam
104	A	7MR1.1	7MG1.3	2002
105	C	7MR1.1	7NS1.2	2001
106	B	7MR1.2	7AF1.1	2002
107	B	7MR1.2	7MG1.1	2001
108	A	7MR1.2	7AF1.1	2004
109	C	7MR2.1	7NS1.2	2003
110	C	7MR2.1	7NS1.2	2001
111	B	7MR2.1	7NS1.3	2004
112	D	7MR2.3	7PS1.2	2002
113	C	7MR2.3	7AF1.5	2001
114	A	7MR2.4	7AF1.1	2003
115	C	7MR2.4	7NS1.2	2001
116	A	7MR3.3	7AF4.1	2003
117	C	7MR3.3	7NS1.2	2002

## ALGEBRA I

The following ten California mathematics academic content standards from the Algebra I strand are assessed on the CAHSEE by 12 test questions and are represented in this booklet by 27 released test questions. These questions represent only a few of the ways in which these standards may be assessed on the CAHSEE.

ALGEBRA I	
Standard Set 2.0	Students understand and use such operations as taking the opposite, finding the reciprocal, <u>and</u> taking a root, <u>and raising to a fractional power</u> . They understand and use the rules of exponents.*
Standard Set 3.0	Students solve equations and inequalities involving absolute values.
Standard Set 4.0	Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x-5) + 4(x-2) = 12$ .
Standard Set 5.0	Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.
Standard Set 6.0	Students graph a linear equation and compute the $x$ - and $y$ - intercepts (e.g., graph $2x + 6y = 4$ ). <del>They are also able to sketch the region defined by linear inequality (e.g., they sketch the region defined by <math>2x + 6y &lt; 4</math>).</del> *
Standard Set 7.0	Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations. <del>by using the point-slope formula.</del> *
Standard Set 8.0	Students understand the concepts of parallel lines <del>and perpendicular lines</del> and how their slopes are related. <del>Students are able to find the equation of a line perpendicular to a given line that passes through a given point.</del> *
Standard Set 9.0	Students solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically. Students are able to solve a system of two linear inequalities in two variables and to sketch the solution sets.
Standard Set 10.0	Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques.
Standard Set 15.0	Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems.

\* The crossed-out portion of this standard is not assessed on the CAHSEE, but is still included in grade-level standards.

## Algebra I

118. If  $x = -7$ , then  $-x =$

- A  $-7$
- B  $-\frac{1}{7}$
- C  $\frac{1}{7}$
- D  $7$

M02863

119. The perimeter,  $P$ , of a square may be found by using the formula  $\left(\frac{1}{4}\right)P = \sqrt{A}$ , where  $A$  is the area of the square. What is the perimeter of the square with an area of 36 square inches?

- A 9 inches
- B 12 inches
- C 24 inches
- D 72 inches

M00057

120. If  $x$  is an integer, what is the solution to  $|x - 3| < 1$ ?

- A  $\{-3\}$
- B  $\{-3, -2, -1, 0, 1\}$
- C  $\{3\}$
- D  $\{-1, 0, 1, 2, 3\}$

M03035

121. Assume  $y$  is an integer and solve for  $y$ .

$$|y + 2| = 9$$

- A  $\{-11, 7\}$
- B  $\{-7, 7\}$
- C  $\{-7, 11\}$
- D  $\{-11, 11\}$

M02242

122. If  $x$  is an integer, which of the following is the solution set for  $3|x| = 15$ ?

- A  $\{0, 5\}$
- B  $\{-5, 5\}$
- C  $\{-5, 0, 5\}$
- D  $\{0, 45\}$

M00059

123. Which of the following is equivalent to  $4(x + 5) - 3(x + 2) = 14$ ?

- A  $4x + 20 - 3x - 6 = 14$
- B  $4x + 5 - 3x + 6 = 14$
- C  $4x + 5 - 3x + 2 = 14$
- D  $4x + 20 - 3x - 2 = 14$

M02936

124. Which of the following is equivalent to  $9 - 3x > 4(2x - 1)$ ?

- A  $13 < 11x$
- B  $13 > 11x$
- C  $10 > 11x$
- D  $6x > 0$

M02531

## Algebra I

$$\frac{20}{x} = \frac{4}{x-5}$$

125. Which of the following is equivalent to the equation shown above?

- A  $x(x-5) = 80$
- B  $20(x-5) = 4x$
- C  $20x = 4(x-5)$
- D  $24 = x + (x-5)$

M02403

126. Which of the following is equivalent to  $1 - 2x > 3(x - 2)$ ?

- A  $1 - 2x > 3x - 2$
- B  $1 - 2x > 3x - 5$
- C  $1 - 2x > 3x - 6$
- D  $1 - 2x > 3x - 7$

M02231

127. Colleen solved the equation  $2(2x + 5) = 8$  using the following steps.

Given:  $2(2x + 5) = 8$

Step 1:  $4x + 10 = 8$

Step 2:  $4x = -2$

Step 3:  $x = -\frac{1}{2}$

To get from Step 2 to Step 3, Colleen—

- A divided both sides by 4.
- B subtracted 4 from both sides.
- C added 4 to both sides.
- D multiplied both sides by 4.

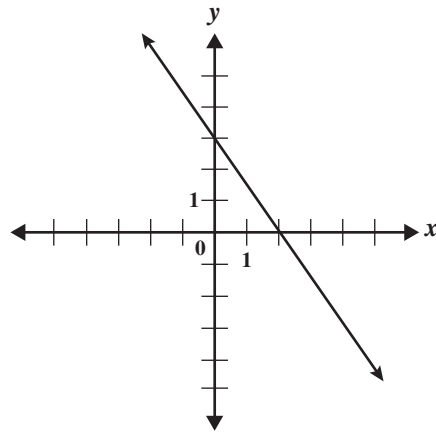
M03139

128. Solve for  $x$ .

$$5(2x - 3) - 6x < 9$$

- A  $x < -1.5$
- B  $x < 1.5$
- C  $x < 3$
- D  $x < 6$

M02938



129. What is an equation of the line shown in the graph above?

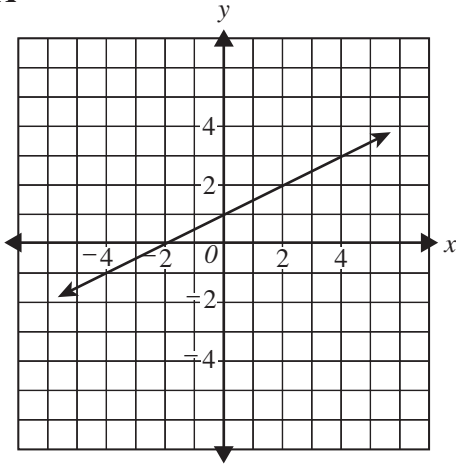
- A  $y = -\frac{3}{2}x + 3$
- B  $y = -\frac{2}{3}x + 2$
- C  $y = \frac{3}{2}x - 3$
- D  $y = \frac{2}{3}x - 2$

M00228

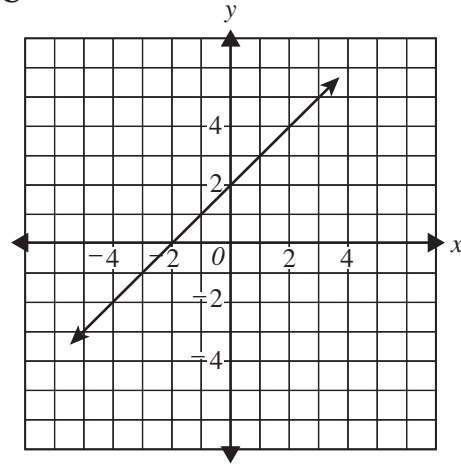
*Algebra I*

130. Which of the following is the graph of  $y = \frac{1}{2}x + 2$ ?

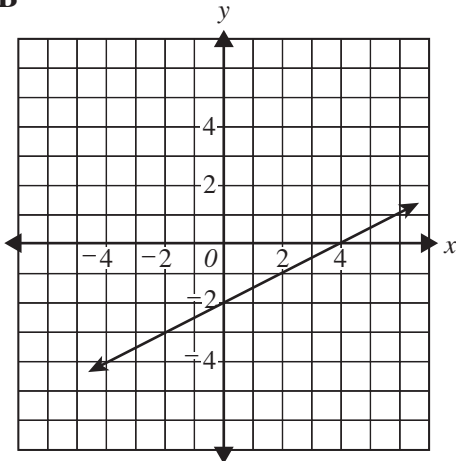
A



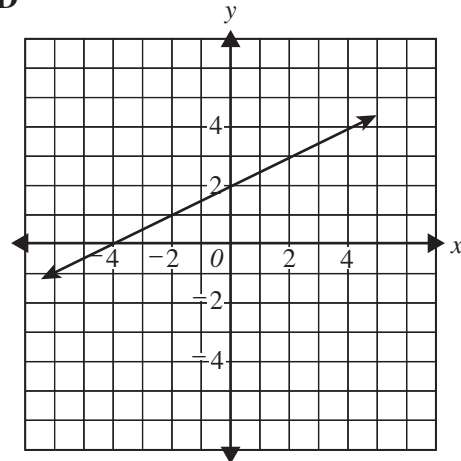
C



B



D



M02026

*Algebra I*

131. What is the  $y$ -intercept of the line

$$2x - 3y = 12?$$

- A (0, -4)
- B (0, -3)
- C (2, 0)
- D (6, 0)

M02591

132. What are the coordinates of the  $x$ -intercept of the line  $3x + 4y = 12$ ?

- A (0, 3)
- B (3, 0)
- C (0, 4)
- D (4, 0)

M02462

133. Which of the following points lies on the line  $y = x$ ?

- A (-4, -4)
- B (-4, 4)
- C (4, -4)
- D (-4, 0)

M02594

134. Which of the following points lies on the line  $4x + 5y = 20$ ?

- A (0, 4)
- B (0, 5)
- C (4, 5)
- D (5, 4)

M02565

135. What is the slope of a line parallel to the line

$$y = \frac{1}{3}x + 2?$$

- A -3
- B  $-\frac{1}{3}$
- C  $\frac{1}{3}$
- D 2

M02653

136. Which of the following statements describes parallel lines?

- A Same  $y$ -intercept but different slopes
- B Same slope but different  $y$ -intercepts
- C Opposite slopes but same  $x$ -intercepts
- D Opposite  $x$ -intercepts but same  $y$ -intercept

M02610

137. Which of the following could be the equation of a line parallel to the line  $y = 4x - 7$ ?

- A  $y = \frac{1}{4}x - 7$
- B  $y = 4x + 3$
- C  $y = -4x + 3$
- D  $y = -\frac{1}{4}x - 7$

M02651

*Algebra I*

$$\begin{cases} 7x + 3y = -8 \\ -4x - y = 6 \end{cases}$$

138. What is the solution to the system of equations shown above?

- A  $(-2, -2)$
- B  $(-2, 2)$
- C  $(2, -2)$
- D  $(2, 2)$

M02956

$$\begin{cases} y = 3x - 5 \\ y = 2x \end{cases}$$

139. What is the solution of the system of equations shown above?

- A  $(1, -2)$
- B  $(1, 2)$
- C  $(5, 10)$
- D  $(-5, -10)$

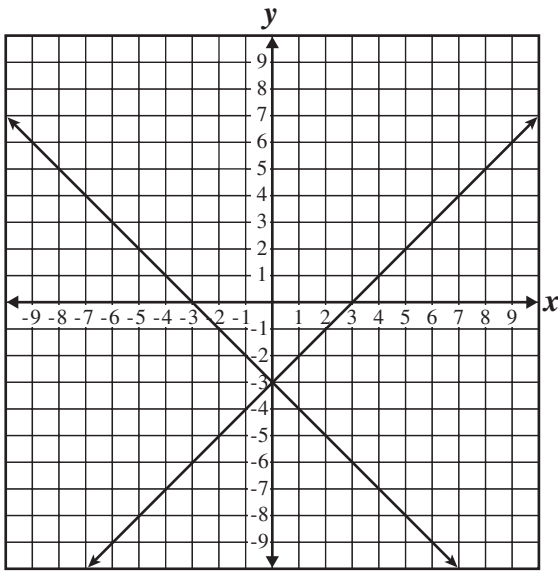
M02649

*Algebra I*

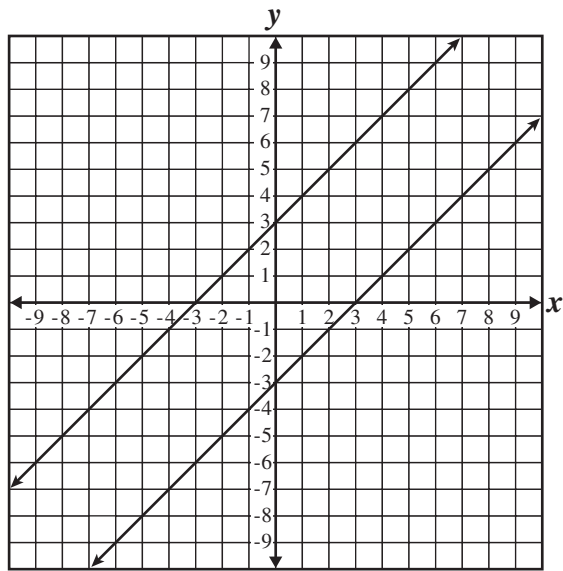
140. Which graph represents the system of equations shown below?

$$\begin{cases} y = -x + 3 \\ y = x + 3 \end{cases}$$

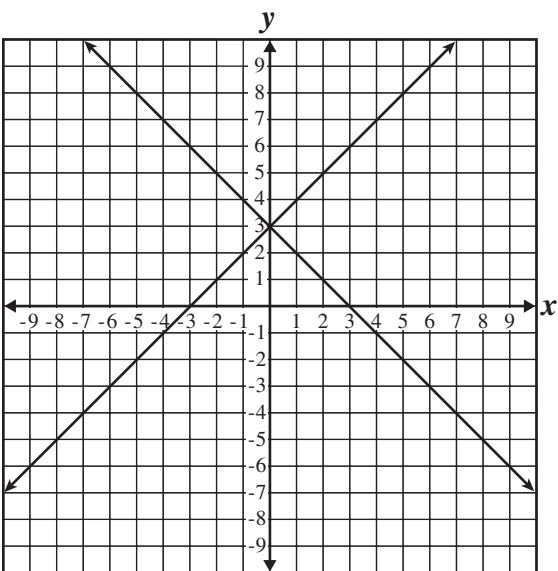
A



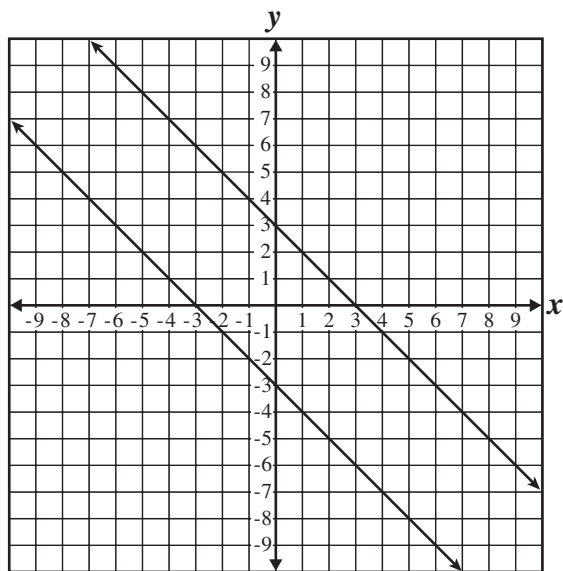
C



B



D



M12449

## Algebra I

141. Simplify.

$$(x^2 - 3x + 1) - (x^2 + 2x + 7)$$

- A  $x - 6$   
 B  $-x + 8$   
 C  $-5x - 6$   
 D  $2x^2 - x + 8$

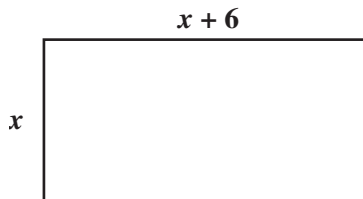
M03355

143. Simplify.

$$\frac{4x^3 + 2x^2 - 8x}{2x}$$

- A  $2x^2 + x - 4$   
 B  $4x^2 + 2x - 8$   
 C  $2x^2 + 2x^2 - 8x$   
 D  $8x^4 + 4x^3 - 16x^2$

M03354



142. The length of the rectangle above is 6 units longer than the width. Which expression could be used to represent the area of the rectangle?

- A  $x^2 + 6x$   
 B  $x^2 - 36$   
 C  $x^2 + 6x + 6$   
 D  $x^2 + 12x + 36$

M00402

144. Mr. Jacobs can correct 150 quizzes in 50 minutes. His student aide can correct 150 quizzes in 75 minutes. Working together, how many minutes will it take them to correct 150 quizzes?

- A 30  
 B 60  
 C 63  
 D 125

M03000

*Algebra I*

Question Number	Correct Answer	Standard	Year of Exam
118	D	1A2.0	2002
119	C	1A2.0	2002
120	C	1A3.0	2002
121	A	1A3.0	2001
122	B	1A3.0	2001
123	A	1A4.0	2002
124	B	1A4.0	2002
125	B	1A4.0	2001
126	C	1A4.0	2001
127	A	1A5.0	2003
128	D	1A5.0	2002
129	A	1A6.0	2003
130	D	1A6.0	2002
131	A	1A6.0	2001
132	D	1A6.0	2001
133	A	1A7.0	2003
134	A	1A7.0	2002
135	C	1A8.0	2002
136	B	1A8.0	2001
137	B	1A8.0	2001
138	B	1A9.0	2002
139	C	1A9.0	2001
140	B	1A9.0	2004
141	C	1A10.0	2003
142	A	1A10.0	2001
143	A	1A10.0	2004
144	A	1A15.0	2002