# Introduction - Algebra I

The following released test questions are taken from the Algebra I Standards Test. This test is one of the California Standards Tests administered as part of the Standardized Testing and Reporting (STAR) Program under policies set by the State Board of Education.

All questions on the California Standards Tests are evaluated by committees of content experts, including teachers and administrators, to ensure their appropriateness for measuring the California academic content standards in Algebra I. 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 contains released test questions from the California Standards Test forms in 2003, 2004, 2005, 2006, and 2007. First on the pages that follow are lists of the standards assessed on the Algebra I Test. Next are released test questions. Following the questions is a table that gives the correct answer for each question, the content standard that each question is measuring, and the year each question last appeared on the test.

The following table lists each reporting cluster, the number of items that appear on the exam, and the number of released test questions that appear in this document. Some of the released test questions for Algebra I are the same test questions found in different combinations on the Integrated Mathematics 1 and 2 California Standards Tests and the Summative High School Mathematics California Standards Test.

| REPORTING CLUSTER | NUMBER OF QUESTIONS ON EXAM | NUMBER OF RELEASED TEST QUESTIONS |
|---|---|---|
| Number Properties, Operations, and Linear Equations | 17 | 22 |
| Graphing and Systems of Linear Equations | 14 | 16 |
| Quadratics and Polynomials | 21 | 25 |
| Functions and Rational Expressions | 13 | 17 |
| TOTAL | 65 | 80 |

In selecting test questions for release, three criteria are used: (1) the questions adequately cover a selection of the academic content standards assessed on the Algebra I Test; (2) the questions demonstrate a range of difficulty; and (3) the questions present a variety of ways standards 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 California Standards Tests, visit the California Department of Education's Web site at http://www.cde.ca.gov/ta/tg/sr/resources.asp.

## THE NUMBER PROPERTIES, OPERATIONS, AND LINEAR EQUATIONS REPORTING CLUSTER

The following 11 California content standards are included in the Number Properties, Operations, and Linear Equations reporting cluster and are represented in this booklet by 22 test questions. These questions represent only some ways in which these standards may be assessed on the Algebra I California Mathematics Standards Test.

### CALIFORNIA CONTENT STANDARDS IN THIS REPORTING CLUSTER

| **Algebra I** | |
|---|---|
| **Standard Set 1.0** | **Students identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable:** |
| 1.1 | Students use properties of numbers to demonstrate whether assertions are true or false. |
| 2.0* | Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents. |
| 3.0 | Students solve equations and inequalities involving absolute values. |
| 4.0* | Students simplify expressions prior to solving linear equations and inequalities in one variable, such as $3(2x - 5) + 4(x - 2) = 12$. |
| 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 24.0** | **Students use and know simple aspects of a logical argument:** |
| 24.1 | Students explain the difference between inductive and deductive reasoning and identify and provide examples of each. |
| 24.2 | Students identify the hypothesis and conclusion in logical deduction. |
| 24.3 | Students use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion. |
| **Standard Set 25.0** | **Students use properties of the number system to judge the validity of results, to justify each step of a procedure, and to prove or disprove statements:** |
| 25.1 | Students use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions. |
| 25.2 | Students judge the validity of an argument according to whether the properties of the real number system and the order of operations have been applied correctly at each step. |
| 25.3 | Given a specific algebraic statement involving linear, quadratic, or absolute value expressions or equations or inequalities, students determine whether the statement is true sometimes, always, or never. |

* Denotes key standards

## THE GRAPHING AND SYSTEMS OF LINEAR EQUATIONS REPORTING CLUSTER

The following four California content standards are included in the Graphing and Systems of Linear Equations reporting cluster and are represented in this booklet by 16 test questions. These questions represent only some ways in which these standards may be assessed on the Algebra I California Mathematics Standards Test.

### CALIFORNIA CONTENT STANDARDS IN THIS REPORTING CLUSTER

| **Algebra I** | |
|---|---|
| 6.0* | Students graph a linear equation and compute the $x$- and $y$-intercepts (e.g., graph $2x + 6y = 4$). They are also able to sketch the region defined by linear inequality (e.g., they sketch the region defined by $2x + 6y < 4$). |
| 7.0* | Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations using the point-slope formula. |
| 8.0 | Students understand the concepts of parallel lines and perpendicular lines and how those slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point. |
| 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. |

* Denotes key standards

## THE QUADRATICS AND POLYNOMIALS REPORTING CLUSTER

The following eight California content standards are included in the Quadratics and Polynomials reporting cluster and are represented in this booklet by 25 test questions. These questions represent only some ways in which these standards may be assessed on the Algebra I California Mathematics Standards Test.

### CALIFORNIA CONTENT STANDARDS IN THIS REPORTING CLUSTER

| **Algebra I** | |
|---|---|
| 10.0* | Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques. |
| 11.0 | Students apply basic factoring techniques to second- and simple third-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials. |
| 14.0* | Students solve a quadratic equation by factoring or completing the square. |
| 19.0* | Students know the quadratic formula and are familiar with its proof by completing the square. |
| 20.0* | Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations. |
| 21.0* | Students graph quadratic functions and know that their roots are the *x*-intercepts. |
| 22.0 | Students use the quadratic formula or factoring techniques or both to determine whether the graph of a quadratic function will intersect the *x*-axis in zero, one, or two points. |
| 23.0* | Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity. |

* Denotes key standards

## THE FUNCTIONS AND RATIONAL EXPRESSIONS REPORTING CLUSTER

The following six California content standards are included in the Functions and Rational Expressions reporting cluster and are represented in this booklet by 17 test questions. These questions represent only some ways in which these standards may be assessed on the Algebra I California Mathematics Standards Test.

### CALIFORNIA CONTENT STANDARDS IN THIS REPORTING CLUSTER

| **Algebra I** | |
|---|---|
| 12.0* | Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms. |
| 13.0* | Students add, subtract, multiply, and divide rational expressions and functions. Students solve both computationally and conceptually challenging problems by using these techniques. |
| 15.0* | Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems. |
| 16.0 | Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions. |
| 17.0 | Students determine the domain of independent variables and the range of dependent variables defined by a graph, a set of ordered pairs, or a symbolic expression. |
| 18.0 | Students determine whether a relation defined by a graph, a set of ordered pairs, or a symbolic expression is a function and justify the conclusion. |

* Denotes key standards

# Algebra I

## Released Test Questions

**1** **Is the equation $3(2x-4)=-18$ equivalent to $6x-12=-18$?**

**A** Yes, the equations are equivalent by the Associative Property of Multiplication.

**B** Yes, the equations are equivalent by the Commutative Property of Multiplication.

**C** Yes, the equations are equivalent by the Distributive Property of Multiplication over Addition.

**D** No, the equations are not equivalent.

CSA10108

**2** $$\sqrt{16}+\sqrt[3]{8}=$$

**A** 4

**B** 6

**C** 9

**D** 10

CSA00471

**3** **Which expression is equivalent to $x^6x^2$?**

**A** $x^4x^3$

**B** $x^5x^3$

**C** $x^7x^3$

**D** $x^9x^3$

CSA20167

**4** **Which number does *not* have a reciprocal?**

**A** $-1$

**B** $0$

**C** $\frac{1}{1000}$

**D** $3$

CSA10152

**5** **What is the multiplicative inverse of $\frac{1}{2}$?**

**A** $-2$

**B** $-\frac{1}{2}$

**C** $\frac{1}{2}$

**D** $2$

CSA10153

**6** **What is the solution for this equation?**

$$|2x-3|=5$$

**A** $x=-4$ or $x=4$

**B** $x=-4$ or $x=3$

**C** $x=-1$ or $x=4$

**D** $x=-1$ or $x=3$

CSA00264

**7** **What is the solution set of the inequality $5-|x+4|\leq -3$?**

**A** $-2\leq x\leq 6$

**B** $x\leq -2$ or $x\geq 6$

**C** $-12\leq x\leq 4$

**D** $x\leq -12$ or $x\geq 4$

CSA10036

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**8** **Which equation is equivalent to $5x-2(7x+1)=14x$?**

**A** $-9x-2=14x$

**B** $-9x+1=14x$

**C** $-9x+2=14x$

**D** $12x-1=14x$

CSA00206

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**9** **Which equation is equivalent to $4(2-5x)=6-3(1-3x)$?**

**A** $8x=5$

**B** $8x=17$

**C** $29x=5$

**D** $29x=17$

CSA00059

**10** **The total cost ($c$) in dollars of renting a sailboat for $n$ days is given by the equation**

$$c=120+60n.$$

**If the total cost was $360, for how many days was the sailboat rented?**

**A** 2

**B** 4

**C** 6

**D** 8

CSA00485

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**11** **Solve:** $3(x+5)=2x+35$

**Step 1:** $3x+15=2x+35$
**Step 2:** $5x+15=35$
**Step 3:** $5x=20$
**Step 4:** $x=4$

**Which is the first *incorrect* step in the solution shown above?**

**A** Step 1

**B** Step 2

**C** Step 3

**D** Step 4

CSA00332

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**12** **A 120-foot-long rope is cut into 3 pieces. The first piece of rope is twice as long as the second piece of rope. The third piece of rope is three times as long as the second piece of rope. What is the length of the longest piece of rope?**

**A** 20 feet

**B** 40 feet

**C** 60 feet

**D** 80 feet

CSA10052

**13** **The cost to rent a construction crane is $750 per day plus $250 per hour of use. What is the maximum number of hours the crane can be used each day if the rental cost is not to exceed $2500 per day?**

**A** 2.5

**B** 3.7

**C** 7.0

**D** 13.0

CSA10057

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**14** **What is the solution to the inequality $x-5>14$?**

**A** $x>9$

**B** $x>19$

**C** $x<9$

**D** $x<19$

CSA00487

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**15** **The lengths of the sides of a triangle are $y$, $y+1$, and 7 centimeters. If the perimeter is 56 centimeters, what is the value of $y$?**

**A** 24

**B** 25

**C** 31

**D** 32

CSA10046

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**16** **Which number serves as a counterexample to the statement below?**

All positive integers are divisible by 2 or 3.

**A** 100

**B** 57

**C** 30

**D** 25

CSG10197

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**17** **What is the conclusion of the statement in the box below?**

If $x^2=4$, then $x=-2$ or $x=2$.

**A** $x^2=4$

**B** $x=-2$

**C** $x=2$

**D** $x=-2$ or $x=2$

CSA30045

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**18** **Which of the following is a valid conclusion to the statement "If a student is a high school band member, then the student is a good musician"?**

**A** All good musicians are high school band members.

**B** A student is a high school band member.

**C** All students are good musicians.

**D** All high school band members are good musicians.

CSA30095

**19** **The chart below shows an expression evaluated for four different values of $x$.**

| $x$ | $x^2 + x + 5$ |
|---|---|
| 1 | 7 |
| 2 | 11 |
| 6 | 47 |
| 7 | 61 |

**Josiah concluded that for all positive values of $x$, $x^2 + x + 5$ produces a prime number. Which value of $x$ serves as a counterexample to prove Josiah's conclusion false?**

**A** 5

**B** 11

**C** 16

**D** 21

CSA20027

**20** **John's solution to an equation is shown below.**

**Given:** $x^2 + 5x + 6 = 0$

**Step 1:** $(x + 2)(x + 3) = 0$

**Step 2:** $x + 2 = 0$ **or** $x + 3 = 0$

**Step 3:** $x = -2$ **or** $x = -3$

**Which property of real numbers did John use for Step 2?**

**A** multiplication property of equality

**B** zero product property of multiplication

**C** commutative property of multiplication

**D** distributive property of multiplication over addition

CSA20034

**21** **Stan's solution to an equation is shown below.**

**Given:** $n + 8(n + 20) = 110$

**Step 1:** $n + 8n + 20 = 110$

**Step 2:** $9n + 20 = 110$

**Step 3:** $9n = 110 - 20$

**Step 4:** $9n = 90$

**Step 5:** $\frac{9n}{9} = \frac{90}{9}$

**Step 6:** $n = 10$

**Which statement about Stan's solution is true?**

**A** Stan's solution is correct.

**B** Stan made a mistake in Step 1.

**C** Stan made a mistake in Step 3.

**D** Stan made a mistake in Step 5.

CSA20035

**22** **When is this statement true?**

> The opposite of a number is less than the original number.

**A** This statement is never true.

**B** This statement is always true.

**C** This statement is true for positive numbers.

**D** This statement is true for negative numbers.

CSA20147

**23** **What is the *y*-intercept of the graph of $4x + 2y = 12$?**

**A** $-4$

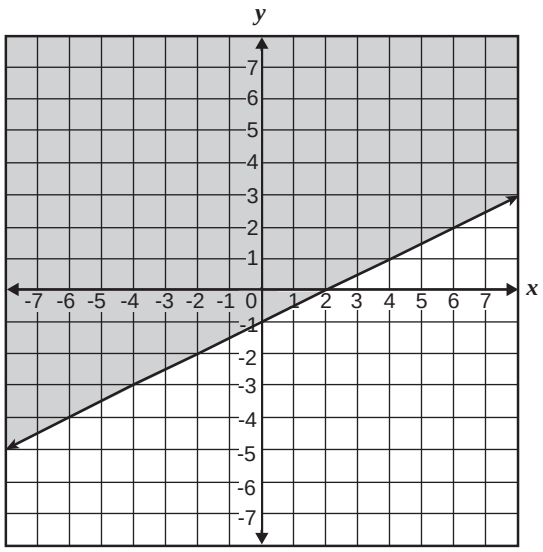
**B** $-2$

**C** 6

**D** 12

CSA00239

**24** **Which inequality is shown on the graph below?**




**A** $y < \frac{1}{2}x - 1$

**B** $y \leq \frac{1}{2}x - 1$

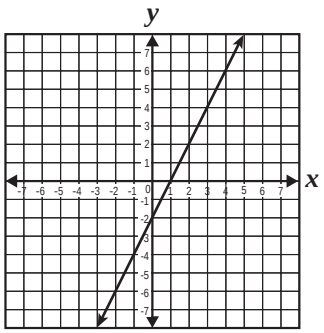
**C** $y > \frac{1}{2}x - 1$

**D** $y \geq \frac{1}{2}x - 1$

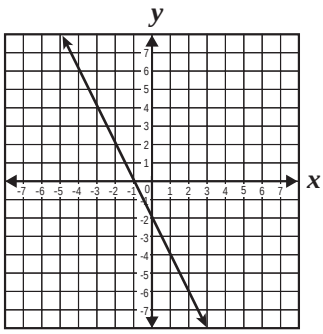
CSA10130

**25** **Which *best* represents the graph of $y = 2x - 2$?**

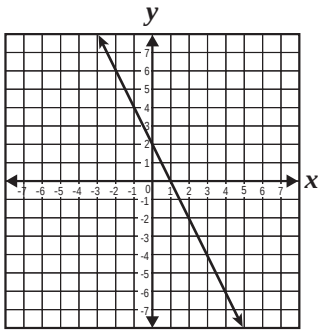
**A**



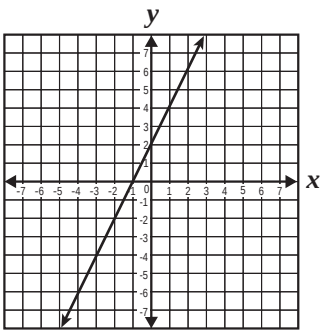

**C**




**B**

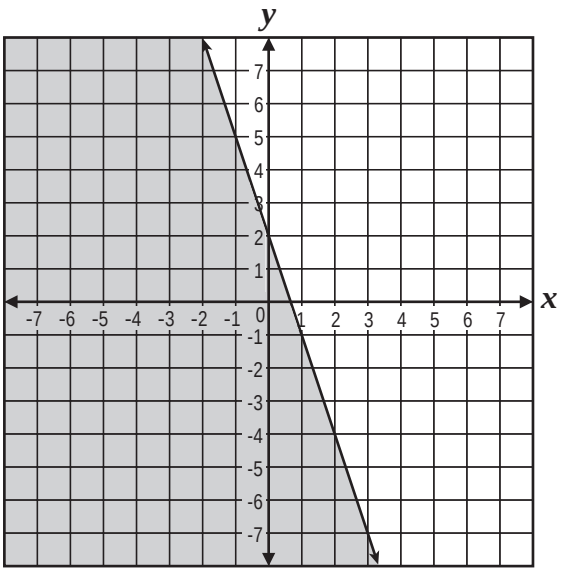



**D**




CSA00299

**26** **Which inequality does the shaded region of the graph represent?**




**A** $3x + y \leq 2$

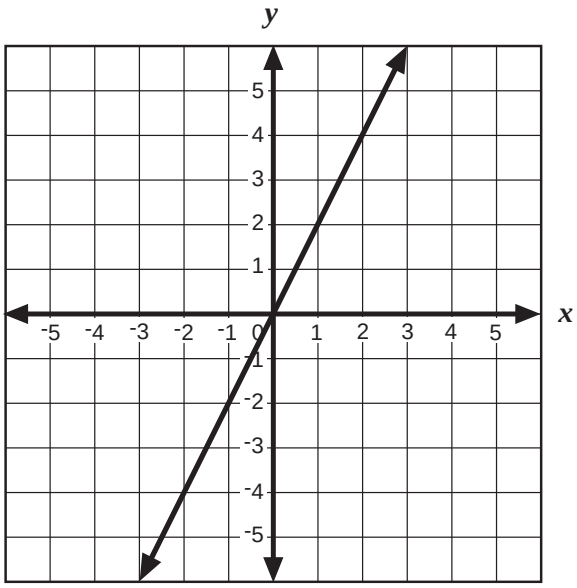
**B** $3x + y \geq 2$

**C** $3x + y \leq -2$

**D** $3x + y \geq -2$

CSA20055

**27**




**Which equation *best* represents the graph above?**

**A** $y = x$

**B** $y = 2x$

**C** $y = x + 2$

**D** $y = 2x + 2$

CSA00508

**28** **Which point lies on the line defined by $3x + 6y = 2$?**

**A** (0, 2)

**B** (0, 6)

**C** $\left(1, -\frac{1}{6}\right)$

**D** $\left(1, -\frac{1}{3}\right)$

CSA00009

**29** **What is the equation of the line that has a slope of 4 and passes through the point $(3, -10)$?**

**A** $y = 4x - 22$

**B** $y = 4x + 22$

**C** $y = 4x - 43$

**D** $y = 4x + 43$

CSA10150

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**30** **The data in the table show the cost of renting a bicycle by the hour, including a deposit.**

**Renting a Bicycle**

| Hours *(h)* | Cost in dollars *(c)* |
|---|---|
| 2 | 15 |
| 5 | 30 |
| 8 | 45 |

**If hours, *h*, were graphed on the horizontal axis and cost, *c*, were graphed on the vertical axis, what would be the equation of a line that fits the data?**

**A** $c = 5h$

**B** $c = \frac{1}{5}h + 5$

**C** $c = 5h + 5$

**D** $c = 5h - 5$

CSA10005

**31** **Some ordered pairs for a linear function of *x* are given in the table below.**

| *x* | *y* |
|---|---|
| 1 | 1 |
| 3 | 7 |
| 5 | 13 |
| 7 | 19 |

**Which of the following equations was used to generate the table above?**

**A** $y = 2x + 1$

**B** $y = 2x - 1$

**C** $y = 3x - 2$

**D** $y = 4x - 3$

CSA10181

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**32** **The equation of line *l* is $6x + 5y = 3$, and the equation of line *q* is $5x - 6y = 0$. Which statement about the two lines is true?**

**A** Lines *l* and *q* have the same *y*-intercept.

**B** Lines *l* and *q* are parallel.

**C** Lines *l* and *q* have the same *x*-intercept.

**D** Lines *l* and *q* are perpendicular.

CSA00241

**33** **Which equation represents a line that is parallel to $y = -\frac{5}{4}x + 2$?**

**A** $y = -\frac{5}{4}x + 1$

**B** $y = -\frac{4}{5}x + 2$

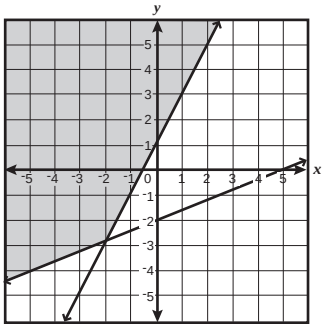
**C** $y = \frac{4}{5}x + 3$

**D** $y = \frac{5}{4}x + 4$

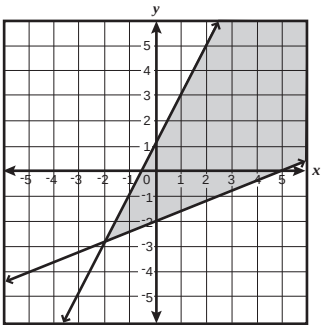
CSA10112

**34** **Which graph *best* represents the solution to this system of inequalities?**

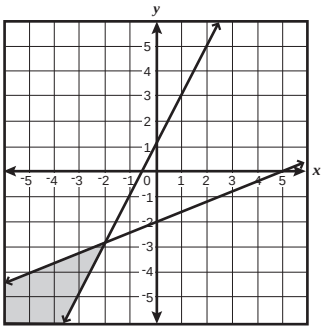
$$\begin{cases} 2x \geq y - 1 \\ 2x - 5y \quad 10 \end{cases}$$



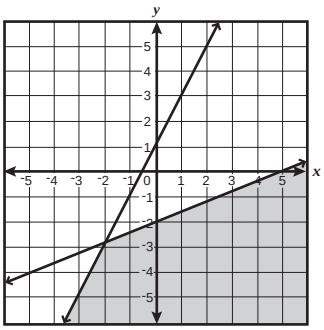
**A**



**C**



**B**



**D**

CSA00516

**35** **What is the solution to this system of equations?**

$$\begin{cases} y = -3x - 2 \\ 6x + 2y = -4 \end{cases}$$

**A** (6, 2)

**B** (1, –5)

**C** no solution

**D** infinitely many solutions

CSA00027

**36** **Which ordered pair is the solution to the system of equations below?**

$$\begin{cases} x+3y=7 \\ x+2y=10 \end{cases}$$

**A** $\left(\frac{7}{2},\frac{13}{4}\right)$

**B** $\left(\frac{7}{2},\frac{17}{5}\right)$

**C** $(-2,$

**D** $(16,-3)$

CSA10131

**37** **Marcy has a total of 100 dimes and quarters. If the total value of the coins is $14.05, how many quarters does she have?**

**A** 27

**B** 40

**C** 56

**D** 73

CSA20083

**38** **Which of the following *best* describes the graph of this system of equations?**

$$\begin{cases} y=-2x+3 \\ 5y=-10x+15 \end{cases}$$

**A** two identical lines

**B** two parallel lines

**C** two lines intersecting in only one point

**D** two lines intersecting in only two points

CSA00509

**39** $\frac{5x^3}{10x^7}=$

**A** $2x^4$

**B** $\frac{1}{2x^4}$

**C** $\frac{1}{5x^4}$

**D** $\frac{x^4}{5}$

CSA00303

**40** $\left(4x^2-2x+8\right)-\left(x^2+3x-2\right)=$

**A** $3x^2+x+6$

**B** $3x^2+x+10$

**C** $3x^2-5x+6$

**D** $3x^2-5x+10$

CSA00086

**41** **The sum of two binomials is $5x^2-6x$. If one of the binomials is $3x^2-2x$, what is the other binomial?**

**A** $2x^2-4x$

**B** $2x^2-8x$

**C** $8x^2+4x$

**D** $8x^2-8x$

CSA10160

**42** **Which of the following expressions is equal to $(x+2)+(x-2)(2x+1)$?**

**A** $2x^2-2x$

**B** $2x^2-4x$

**C** $2x^2+x$

**D** $4x^2+2x$

CSA10191

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**43** **A volleyball court is shaped like a rectangle. It has a width of $x$ meters and a length of $2x$ meters. Which expression gives the area of the court in square meters?**

**A** $3x$

**B** $2x^2$

**C** $3x^2$

**D** $2x^3$

CSA00496

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**44** **Which is the factored form of $3a^2-24ab+48b^2$?**

**A** $(3a-8b)(a-6b)$

**B** $(3a-16b)(a-3b)$

**C** $3(a-4b)(a-4b)$

**D** $3(a-8b)(a-8b)$

CSA00066

**45** **Which is a factor of $x^2-11x+24$?**

**A** $x+3$

**B** $x-3$

**C** $x+4$

**D** $x-4$

CSA00503

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**46** **Which of the following shows $9t^2+12t+4$ factored completely?**

**A** $(3t+2)^2$

**B** $(3t+4)(3t+1)$

**C** $(9t+4)(t+1)$

**D** $9t^2+12t+4$

CSA20106

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**47** **What is the complete factorization of $32-8z^2$?**

**A** $-8(2+z)(2-z)$

**B** $8(2+z)(2-z)$

**C** $-8(2+z)^2$

**D** $8(2-z)^2$

CSA20105

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**48** **If $x^2$ is added to $x$, the sum is 42. Which of the following could be the value of $x$?**

**A** –7

**B** –6

**C** 14

**D** 42

CSA10171

**49** **What quantity should be added to both sides of this equation to complete the square?**

$$x^2 - 8x = 5$$

**A** 4

**B** $-4$

**C** 16

**D** $-16$

CSA00478

**50** **What are the solutions for the quadratic equation $x^2 + 6x = 16$?**

**A** $-2, -8$

**B** $-2, 8$

**C** $2, -8$

**D** $2, 8$

CSA10062

**51** **Leanne correctly solved the equation $x^2 + 4x = 6$ by completing the square. Which equation is part of her solution?**

**A** $(x+2)^2 = 8$

**B** $(x+2)^2 = 10$

**C** $(x+4)^2 = 10$

**D** $(x+4)^2 = 22$

CSA20139

**52** **Carter is solving this equation by factoring.**

$$10x^2 - 25x + 15 = 0$$

**Which expression could be one of his correct factors?**

**A** $x+3$

**B** $x-3$

**C** $2x+3$

**D** $2x-3$

CSA00162

**53** **Toni is solving this equation by completing the square.**

$$ax^2 + bx + c = 0 \text{ (where } a \geq 0)$$

**Step 1:** $ax^2 + bx = -c$

**Step 2:** $x^2 + \frac{b}{a}x = -\frac{c}{a}$

**Step 3:** ?

**Which should be Step 3 in the solution?**

**A** $x^2 = -\frac{c}{b} - \frac{b}{a}x$

**B** $x + \frac{b}{a} = -\frac{c}{ax}$

**C** $x^2 + \frac{b}{a}x + \frac{b}{2a} = -\frac{c}{a} + \frac{b}{2a}$

**D** $x^2 + \frac{b}{a}x + \left(\frac{b}{2a}\right)^2 = -\frac{c}{a} + \left(\frac{b}{2a}\right)^2$

CSA00072

**54** **Four steps to derive the quadratic formula are shown below.**

I $x^2 + \frac{bx}{a} = \frac{-c}{a}$

II $\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$

III $x = \pm\sqrt{\frac{b^2 - 4ac}{4a^2}} - \frac{b}{2a}$

IV $x^2 + \frac{bx}{a} + \left(\frac{b}{2a}\right)^2 = \frac{-c}{a} + \left(\frac{b}{2a}\right)^2$

**What is the correct order for these steps?**

**A** I, IV, II, III

**B** I, III, IV, II

**C** II, IV, I, III

**D** II, III, I, IV

CSA20062

**55** **Which is one of the solutions to the equation $2x^2 - x - 4 = 0$?**

**A** $\frac{1}{4} - \sqrt{33}$

**B** $-\frac{1}{4} + \sqrt{33}$

**C** $\frac{1 + \sqrt{33}}{4}$

**D** $\frac{-1 - \sqrt{33}}{4}$

CSA00314

**56** **Which statement *best* explains why there is no real solution to the quadratic equation $2x^2 + x + 7 = 0$?**

**A** The value of $1^2 - 4 \cdot 2 \cdot 7$ is positive.

**B** The value of $1^2 - 4 \cdot 2 \cdot 7$ is equal to 0.

**C** The value of $1^2 - 4 \cdot 2 \cdot 7$ is negative.

**D** The value of $1^2 - 4 \cdot 2 \cdot 7$ is not a perfect square.

CSA10147

**57** **What is the solution set of the quadratic equation $8x^2 + 2x + 1 = 0$?**

**A** $\left\{-\frac{1}{2}, \frac{1}{4}\right\}$

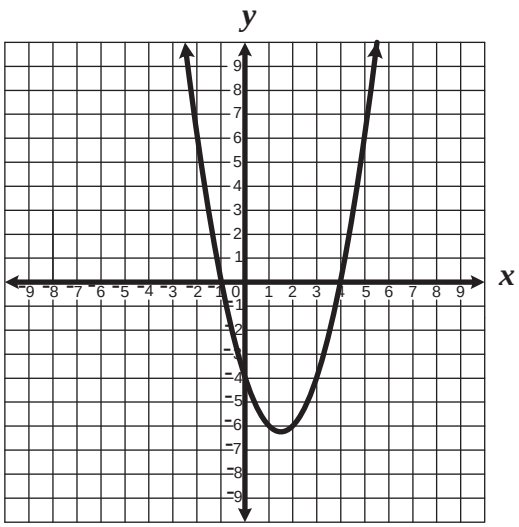
**B** $\left\{-1 + \sqrt{2}, -1 - \sqrt{2}\right\}$

**C** $\left\{\frac{-1 + \sqrt{7}}{8}, \frac{-1 - \sqrt{7}}{8}\right\}$

**D** no real solution

CSA10179

**58** **The graph of the equation $y = x^2 - 3x - 4$ is shown below.**




**For what value or values of $x$ is $y = 0$?**

**A** $x = -1$ only

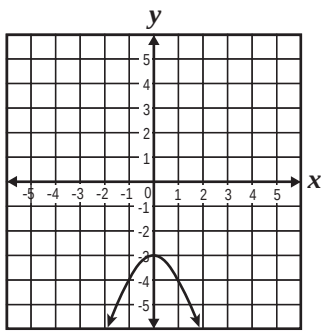
**B** $x = -4$ only

**C** $x = -1$ and $x = 4$

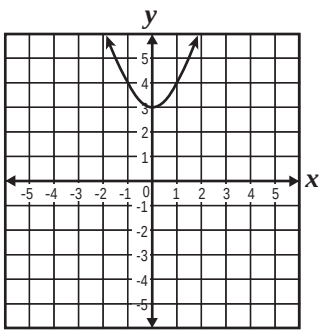
**D** $x = 1$ and $x = -4$

CSA00514

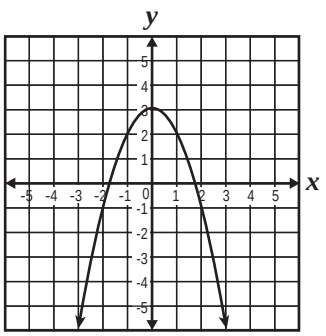
**59** **Which *best* represents the graph of $y = -x^2 + 3$?**



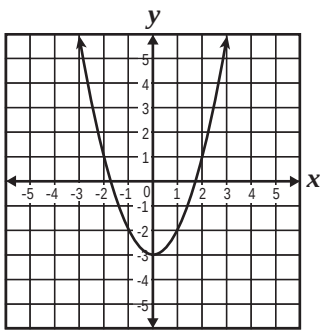

**A**




**C**




**B**




**D**

CSA00519

**60** **Which quadratic function, when graphed, has $x$-intercepts of 4 and $-3$?**

**A** $y = (x - 3)(x + 4)$

**B** $y = (x + 3)(2x - 8)$

**C** $y = (3x - 1)(4x + 1)$

**D** $y = (3x + 1)(8x - 2)$

CSA20115

**61** **How many times does the graph of $y = 2x^2 - 2x + 3$ intersect the $x$-axis?**

**A** none

**B** one

**C** two

**D** three

CSA10084

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**62** **An object that is projected straight downward with initial velocity $v$ feet per second travels a distance $s = vt + 16t^2$, where $t =$ time in seconds. If Ramón is standing on a balcony 84 feet above the ground and throws a penny straight down with an initial velocity of 10 feet per second, in how many seconds will it reach the ground?**

**A** 2 seconds

**B** 3 seconds

**C** 6 seconds

**D** 8 seconds

CSA00158

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**63** **The height of a triangle is 4 inches greater than twice its base. The area of the triangle is 168 square inches. What is the base of the triangle?**

**A** 7 in.

**B** 8 in.

**C** 12 in.

**D** 14 in.

CSA00104

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**64** **What is $\frac{x^2 - 4xy + 4y^2}{3xy - 6y^2}$ reduced to lowest terms?**

**A** $\frac{x - 2y}{3}$

**B** $\frac{x - 2y}{3y}$

**C** $\frac{x + 2y}{3}$

**D** $\frac{x + 2y}{3y}$

CSA00463

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**65** **Simplify $\frac{6x^2 + 21x + 9}{4x^2 - 1}$ to lowest terms.**

**A** $\frac{3(x+1)}{2x-1}$

**B** $\frac{3(x+3)}{2x-1}$

**C** $\frac{3(2x+3)}{4(x-1)}$

**D** $\frac{3(x+3)}{2x+1}$

CSA10025

**66** What is $\frac{x^2-4x+4}{x^2-3x+2}$ reduced to lowest terms?

**A** $\frac{x-2}{x-1}$

**B** $\frac{x-2}{x+1}$

**C** $\frac{x+2}{x-1}$

**D** $\frac{x+2}{x+1}$

CSA10189

**67** What is $\frac{12a^3-20a^2}{16a^2+8a}$ reduced to lowest terms?

**A** $\frac{a}{2}$

**B** $\frac{3a-5}{2a+1}$

**C** $-\frac{2a}{4+2a}$

**D** $\frac{a(3a-5)}{2(2a+1)}$

CSA00013

**68** $\frac{7z^2+7z}{4z+8} \bullet \frac{z^2-4}{z^3+2z^2+z} =$

**A** $\frac{7(z-2)}{4(z+1)}$

**B** $\frac{7(z+2)}{4(z-1)}$

**C** $\frac{7z(z+1)}{4(z+2)}$

**D** $\frac{7z(z-1)}{4(z+2)}$

CSA00067

**69** Which fraction equals the product $\left(\frac{x+5}{3x+2}\right)\left(\frac{2x-3}{x-5}\right)$?

**A** $\frac{2x-3}{3x+2}$

**B** $\frac{3x+2}{4x-3}$

**C** $\frac{x^2-25}{6x^2-5x-6}$

**D** $\frac{2x^2+7x-15}{3x^2-13x-10}$

CSA10029

**70** $\dfrac{x^2+8x+16}{x+3} \div \dfrac{2x+8}{x^2-9} =$

**A** $\dfrac{2(x+4)^2}{(x-3)(x+3)^2}$

**B** $\dfrac{2(x+3)(x-3)}{x+4}$

**C** $\dfrac{(x+4)(x-3)}{2}$

**D** $\dfrac{(x+4)(x-3)^2}{2(x+3)}$

CSA20164

**71** **Which fraction is equivalent to** $\dfrac{\frac{3x}{5}}{\frac{x}{4}+\frac{x}{2}}$**?**

**A** $\dfrac{x^2}{5}$

**B** $\dfrac{9x^2}{20}$

**C** $\dfrac{4}{5}$

**D** $\dfrac{9}{5}$

CSA10141

**72** **A pharmacist mixed some 10%-saline solution with some 15%-saline solution to obtain 100 mL of a 12%-saline solution. How much of the 10%-saline solution did the pharmacist use in the mixture?**

**A** 60 mL

**B** 45 mL

**C** 40 mL

**D** 25 mL

CSA00333

**73** **Andy's average driving speed for a 4-hour trip was 45 miles per hour. During the first 3 hours he drove 40 miles per hour. What was his average speed for the last hour of his trip?**

**A** 50 miles per hour

**B** 60 miles per hour

**C** 65 miles per hour

**D** 70 miles per hour

CSA00576

**74** **One pipe can fill a tank in 20 minutes, while another takes 30 minutes to fill the same tank. How long would it take the two pipes together to fill the tank?**

**A** 50 min

**B** 25 min

**C** 15 min

**D** 12 min

CSA00161

**75** **Two airplanes left the same airport traveling in opposite directions. If one airplane averages 400 miles per hour and the other airplane averages 250 miles per hour, in how many hours will the distance between the two planes be 1625 miles?**

**A** 2.5

**B** 4

**C** 5

**D** 10.8

CSA10055

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**76** **Lisa will make punch that is 25% fruit juice by adding pure fruit juice to a 2-liter mixture that is 10% pure fruit juice. How many liters of pure fruit juice does she need to add?**

**A** 0.4 liter

**B** 0.5 liter

**C** 2 liters

**D** 8 liters

CSA10186

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**77** **Which relation is a function?**

**A** {(–1, 3), (–2, 6), (0, 0), (–2, –2)}

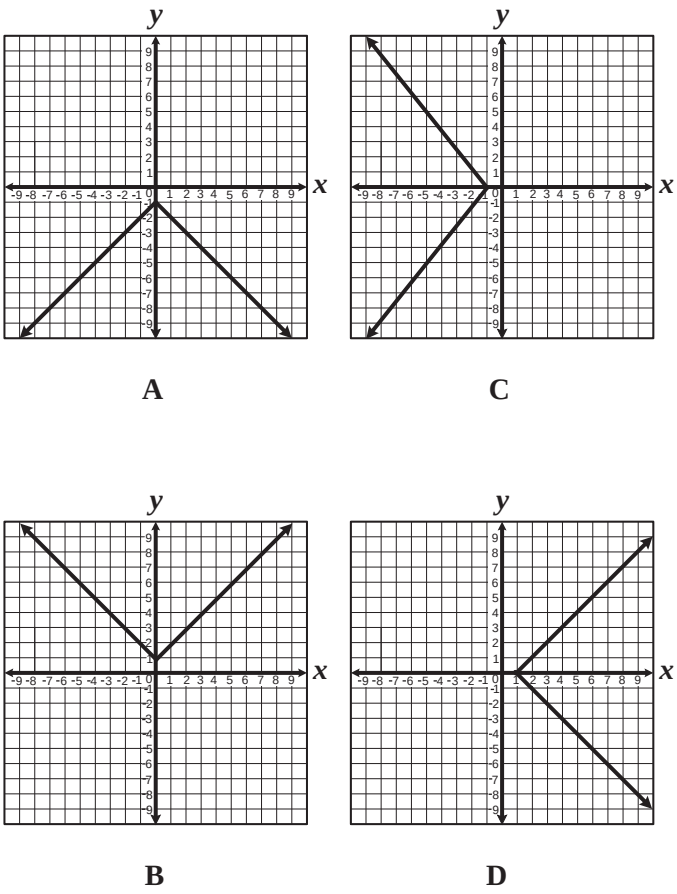
**B** {(–2, –2), (0, 0), (1, 1), (2, 2)}

**C** {(4, 0), (4, 1), (4, 2), (4, 3)}

**D** {(7, 4), (8, 8), (10, 8), (10, 10)}

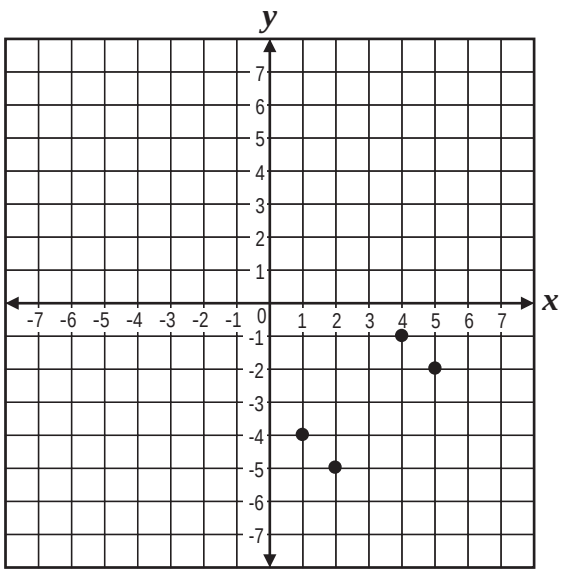
CSA10070

**78** **For which equation graphed below are *all* the *y*-values negative?**




CSA00522

**79** **What is the domain of the function shown on the graph below?**




**A** $\{-1, -2, -3, -4\}$

**B** $\{-1, -2, -4, -5\}$

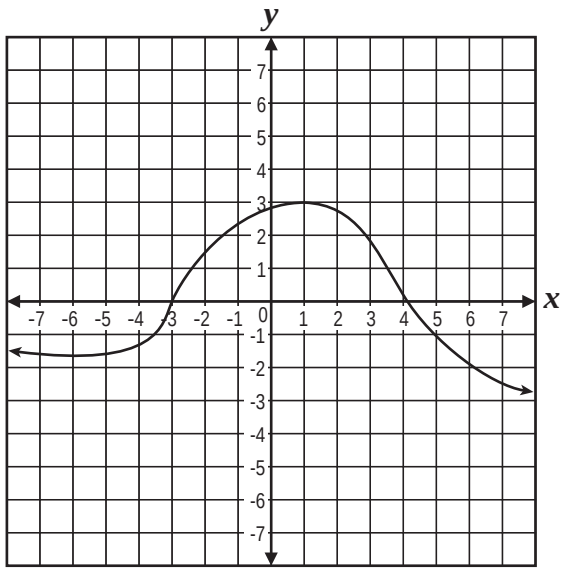
**C** $\{1, 2, 3, 4\}$

**D** $\{1, 2, 4, 5\}$

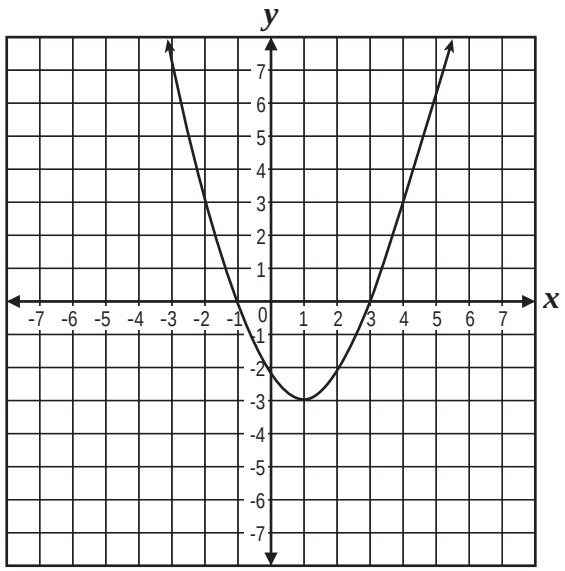
CSA10072

**80** **Which of the following graphs represents a relation that is *not* a function of *x*?**

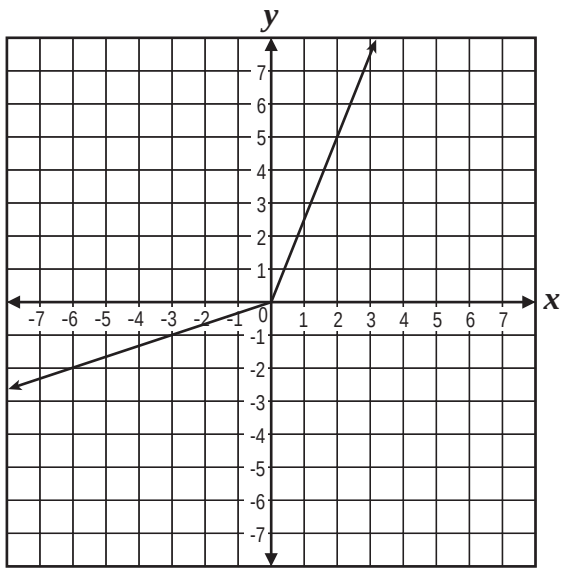
**A**



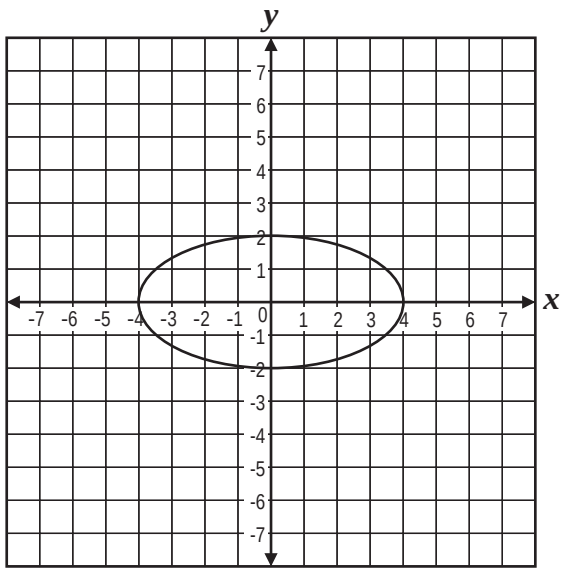

**C**




**B**




**D**




CSA30002

| Question Number | Correct Answer | Standard | Year of Release |
|---|---|---|---|
| 1 | *C* | 1.1 | 2006 |
| 2 | *B* | 2.0 | 2003 |
| 3 | *B* | 2.0 | 2005 |
| 4 | *B* | 2.0 | 2006 |
| 5 | *D* | 2.0 | 2007 |
| 6 | *C* | 3.0 | 2003 |
| 7 | *D* | 3.0 | 2004 |
| 8 | *A* | 4.0 | 2003 |
| 9 | *C* | 4.0 | 2005 |
| 10 | *B* | 5.0 | 2003 |
| 11 | *B* | 5.0 | 2004 |
| 12 | *C* | 5.0 | 2004 |
| 13 | *C* | 5.0 | 2006 |
| 14 | *B* | 5.0 | 2007 |
| 15 | *A* | 5.0 | 2007 |
| 16 | *D* | 24.1 | 2004 |
| 17 | *D* | 24.2 | 2006 |
| 18 | *D* | 24.2 | 2007 |
| 19 | *A* | 24.3 | 2005 |
| 20 | *B* | 25.1 | 2005 |
| 21 | *B* | 25.2 | 2006 |
| 22 | *C* | 25.3 | 2005 |
| 23 | *C* | 6.0 | 2003 |
| 24 | *D* | 6.0 | 2004 |
| 25 | *A* | 6.0 | 2006 |
| 26 | *A* | 6.0 | 2007 |
| 27 | *B* | 6.0 | 2007 |
| 28 | *C* | 7.0 | 2003 |
| 29 | *A* | 7.0 | 2004 |
| 30 | *C* | 7.0 | 2005 |
| 31 | *C* | 7.0 | 2007 |
| 32 | *D* | 8.0 | 2003 |
| 33 | *A* | 8.0 | 2004 |
| 34 | *C* | 9.0 | 2003 |
| 35 | *D* | 9.0 | 2004 |

| Question Number | Correct Answer | Standard | Year of Release |
|---|---|---|---|
| 36 | *D* | 9.0 | 2006 |
| 37 | *A* | 9.0 | 2006 |
| 38 | *A* | 9.0 | 2007 |
| 39 | *B* | 10.0 | 2004 |
| 40 | *D* | 10.0 | 2005 |
| 41 | *A* | 10.0 | 2006 |
| 42 | *A* | 10.0 | 2006 |
| 43 | *B* | 10.0 | 2007 |
| 44 | *C* | 11.0 | 2003 |
| 45 | *B* | 11.0 | 2004 |
| 46 | *A* | 11.0 | 2005 |
| 47 | *B* | 11.0 | 2007 |
| 48 | *A* | 14.0 | 2004 |
| 49 | *C* | 14.0 | 2005 |
| 50 | *C* | 14.0 | 2005 |
| 51 | *B* | 14.0 | 2006 |
| 52 | *D* | 14.0 | 2007 |
| 53 | *D* | 19.0 | 2003 |
| 54 | *A* | 19.0 | 2005 |
| 55 | *C* | 20.0 | 2003 |
| 56 | *C* | 20.0 | 2005 |
| 57 | *D* | 20.0 | 2005 |
| 58 | *C* | 21.0 | 2003 |
| 59 | *B* | 21.0 | 2006 |
| 60 | *B* | 21.0 | 2007 |
| 61 | *A* | 22.0 | 2004 |
| 62 | *A* | 23.0 | 2003 |
| 63 | *C* | 23.0 | 2004 |
| 64 | *B* | 12.0 | 2003 |
| 65 | *B* | 12.0 | 2005 |
| 66 | *A* | 12.0 | 2006 |
| 67 | *D* | 12.0 | 2007 |
| 68 | *A* | 13.0 | 2003 |
| 69 | *D* | 13.0 | 2005 |
| 70 | *C* | 13.0 | 2006 |

| Question Number | Correct Answer | Standard | Year of Release |
|---|---|---|---|
| 71 | *C* | 13.0 | 2007 |
| 72 | *A* | 15.0 | 2003 |
| 73 | *B* | 15.0 | 2004 |
| 74 | *D* | 15.0 | 2006 |
| 75 | *A* | 15.0 | 2006 |
| 76 | *A* | 15.0 | 2007 |
| 77 | *B* | 16.0 | 2004 |
| 78 | *A* | 17.0 | 2004 |
| 79 | *D* | 17.0 | 2005 |
| 80 | *D* | 18.0 | 2007 |