

## 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 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

**6** 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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**7** 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

**8** 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

**9** 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

**10** 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

**11** 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

**12** 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

## Algebra I

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- 13** 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

- 14** 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

- 15** 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

- 16** 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

## Released Test Questions

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- 17** 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

- 18** 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.

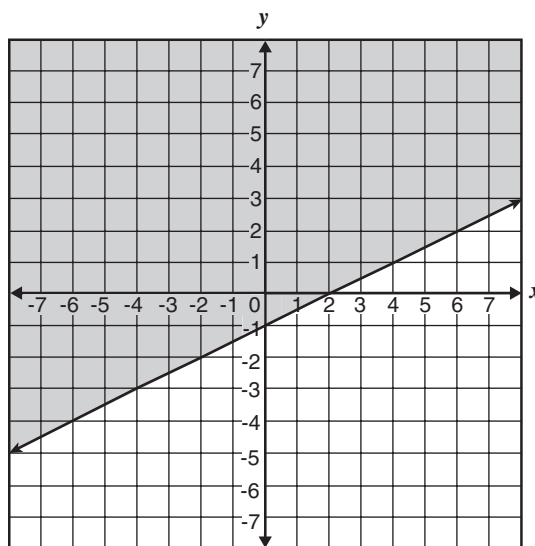
CSA20147

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

- A -4
- B -2
- C 6
- D 12

CSA00239

- 20** Which inequality is shown on the graph below?



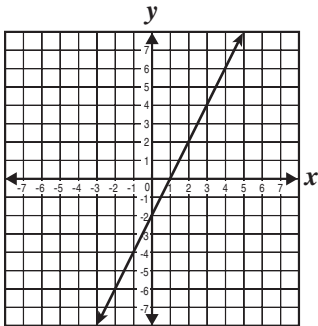
- A  $y < \frac{1}{2}x - 1$
- B  $y \leq \frac{1}{2}x - 1$
- C  $y > \frac{1}{2}x - 1$
- D  $y \geq \frac{1}{2}x - 1$

CSA10130

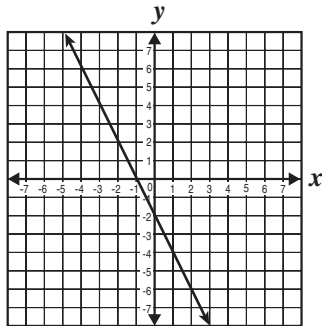
**Algebra I**

**Released Test Questions**

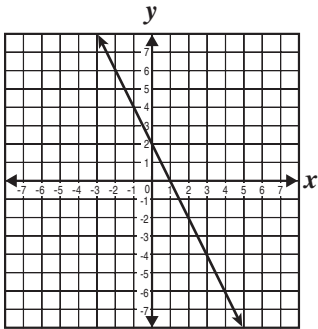
**21** Which *best* represents the graph of  $y = 2x - 2$ ?



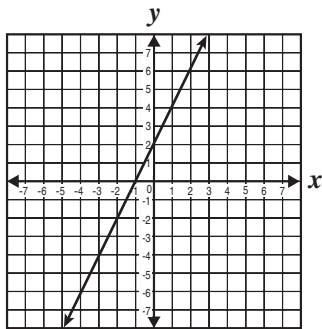
**A**



**C**



**B**



**D**

CSA00299

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

- A (0, 2)
- B (0, 6)
- C  $(1, -\frac{1}{6})$
- D  $(1, -\frac{1}{3})$

CSA00009

**23** 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

**24** 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

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- 25** 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

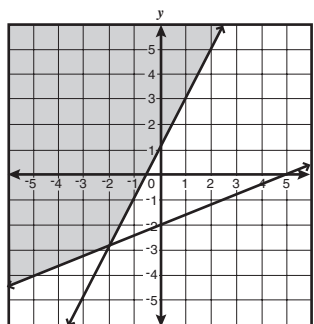
- 26** Which equation represents a line that is parallel to  $y = -\frac{5}{4}x + 2$ ?

- A  $y = -\frac{5}{4}x + 1$   
 B  $y = -\frac{4}{5}x + 2$   
 C  $y = \frac{4}{5}x + 3$   
 D  $y = \frac{5}{4}x + 4$

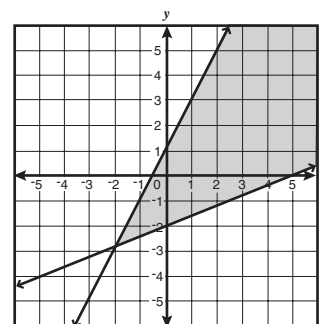
CSA10112

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

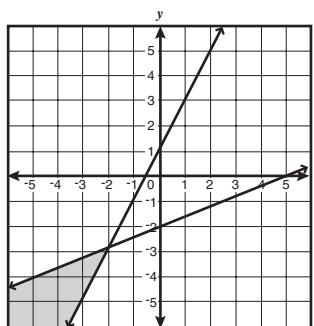
$$\begin{cases} 2x \geq y - 1 \\ 2x - 5y \leq 10 \end{cases}$$



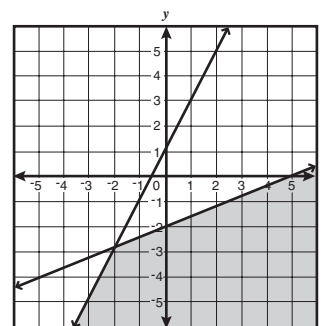
A



C



B



D

CSA00516

- 28** 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

## Algebra I

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- 29** 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  $(-2, 3)$   
 D  $(16, -3)$

CSA10131

- 30** 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

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

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

CSA00303

**32**  $(4x^2 - 2x + 8) - (x^2 + 3x - 2) =$

- A  $3x^2 + x + 6$   
 B  $3x^2 + x + 10$   
 C  $3x^2 - 5x + 6$   
 D  $3x^2 - 5x + 10$

CSA00086

- 33** 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

- 34** 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

## Released Test Questions

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**35** 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

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

- A  $x + 3$
- B  $x - 3$
- C  $x + 4$
- D  $x - 4$

CSA00503

**37** 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

**38** 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

**39** 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

**40** 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

**41** 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



## Algebra I

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- 42** Toni is solving this equation by completing the square.

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

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

- 43** 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

- 44** 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

## Released Test Questions

## Algebra I

- 45** 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.

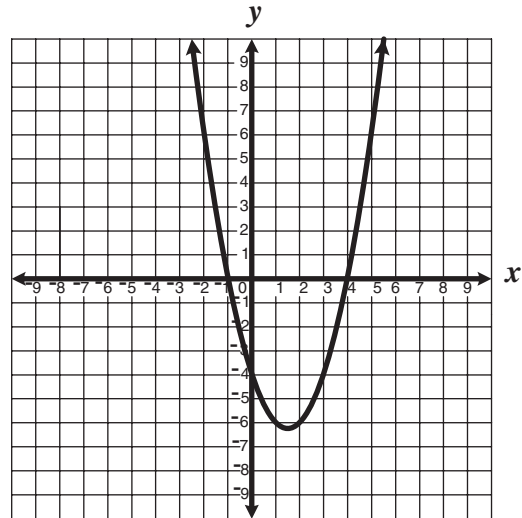
CSA10147

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

- A  $\left\{-\frac{1}{2}, \frac{1}{4}\right\}$   
 B  $\{-1 + \sqrt{2}, -1 - \sqrt{2}\}$   
 C  $\left\{\frac{-1 + \sqrt{7}}{8}, \frac{-1 - \sqrt{7}}{8}\right\}$   
 D no real solution

CSA10179

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



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

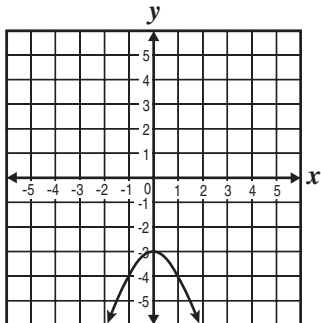
- A  $x = -1$  only  
 B  $x = -4$  only  
 C  $x = -1$  and  $x = 4$   
 D  $x = 1$  and  $x = -4$

CSA00514

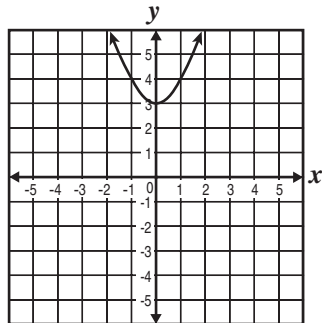
**Algebra I**

**Released Test Questions**

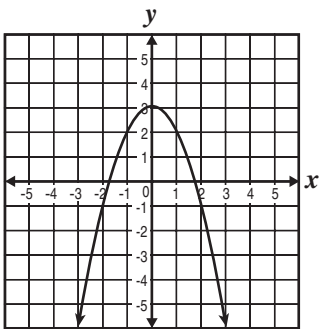
- 48** Which *best* represents the graph of  $y = -x^2 + 3$ ?



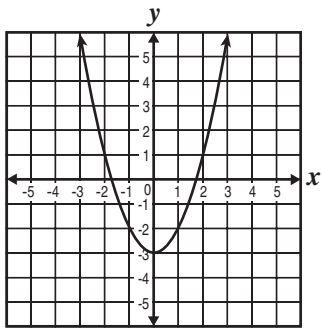
**A**



**C**



**B**



**D**

CSA00519

- 49** 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

- 50** 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

- 51** 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

- 52** 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

## Released Test Questions

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**53** 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

**54** 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

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

- 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

**56** 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

## Algebra I

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**57** 
$$\frac{x^2 + 8x + 16}{x + 3} \div \frac{2x + 8}{x^2 - 9} =$$

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

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

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

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

CSA20164

**58** 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

**59** 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

**60** 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

**61** 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

**62** Which relation is a function?

A  $\{(-1, 3), (-2, 6), (0, 0), (-2, -2)\}$

B  $\{(-2, -2), (0, 0), (1, 1), (2, 2)\}$

C  $\{(4, 0), (4, 1), (4, 2), (4, 3)\}$

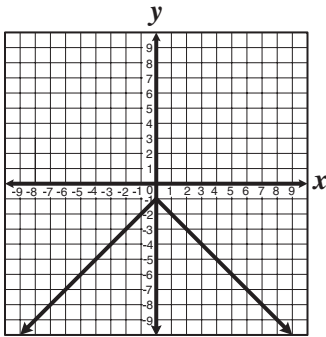
D  $\{(7, 4), (8, 8), (10, 8), (10, 10)\}$

CSA10070

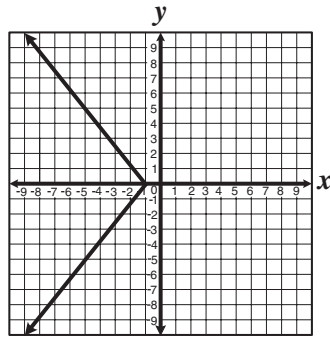
Released Test Questions

Algebra I

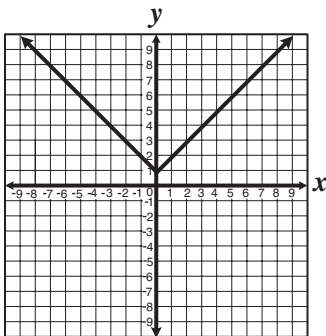
**63** For which equation graphed below are *all* the *y*-values negative?



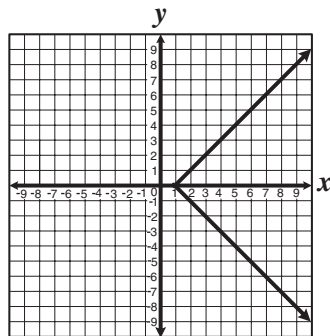
A



C



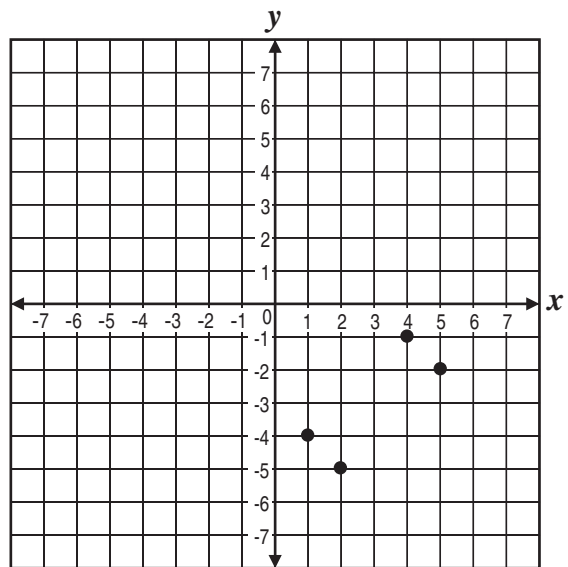
B



D

CSA00522

**64** 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  $\{1, 2, 4, 5\}$

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