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 **Which statement is false?**

A The order in which two whole numbers are subtracted does not affect the difference.

B The order in which two whole numbers are added does not affect the sum.

C The order in which two rational numbers are added does not affect the sum.

D The order in which two rational numbers are multiplied does not affect the product.

CSA00001

---

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

A 4

B 6

C 9

D 10

CSA00471

4 **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

---

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

A -1

B 0

C $\frac{1}{1000}$

D 3

CSA10152

---

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

A -2

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

C $\frac{1}{2}$

D 2

CSA10153

7 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

---

8 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

---

9 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

---

10 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

---

11 Which equation is equivalent to $3\left[7x-4(x-3)\right]+1=16$?

A $9x-2=16$

B $9x+37=16$

C $17x-2=16$

D $17x+13=16$

CSA20078

---

12 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

---

13 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

14 **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

---

15 **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

---

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

A $x>9$

B $x>19$

C $x<9$

D $x<19$

CSA00487

17 **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

---

18 **Beth is two years older than Julio. Gerald is twice as old as Beth. Debra is twice as old as Gerald. The sum of their ages is 38. How old is Beth?**

A 3

B 5

C 6

D 8

CSA20171

19 **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

---

20 **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

---

21 **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

---

22 **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

---

23 **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

24 **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

25 **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

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

A -4

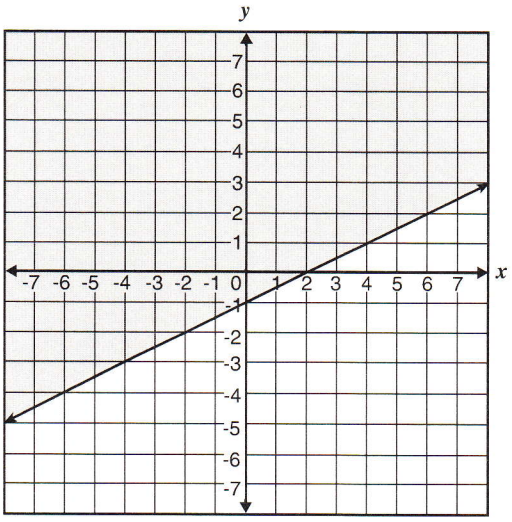
B -2

C 6

D 12

CSA00239

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



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

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

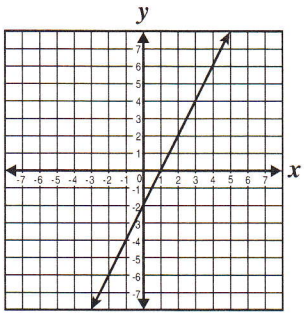
C $y > \frac{1}{2}x - 1$

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

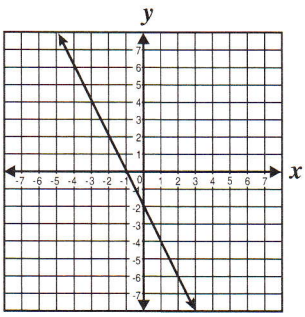
CSA10130

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

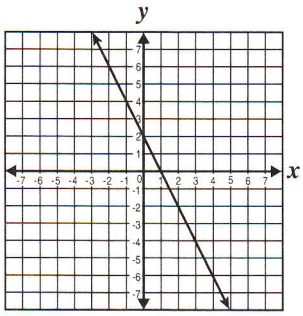
A



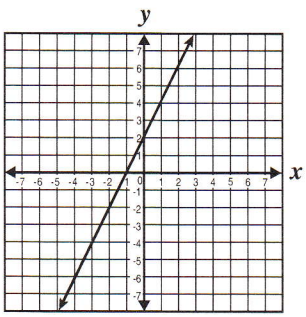
C



B

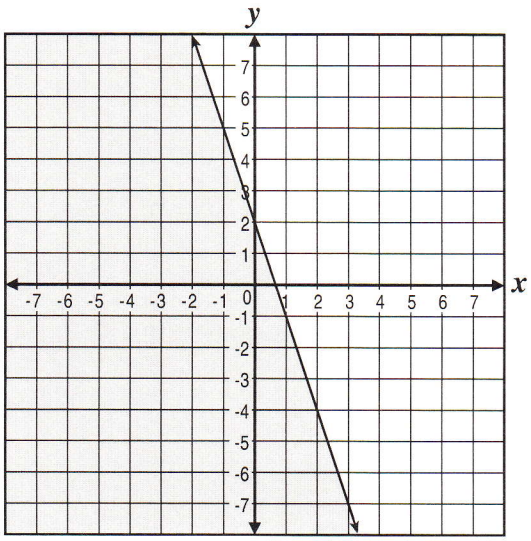


D



CSA00299

29 Which inequality does the shaded region of the graph represent?



A $3x + y \leq 2$

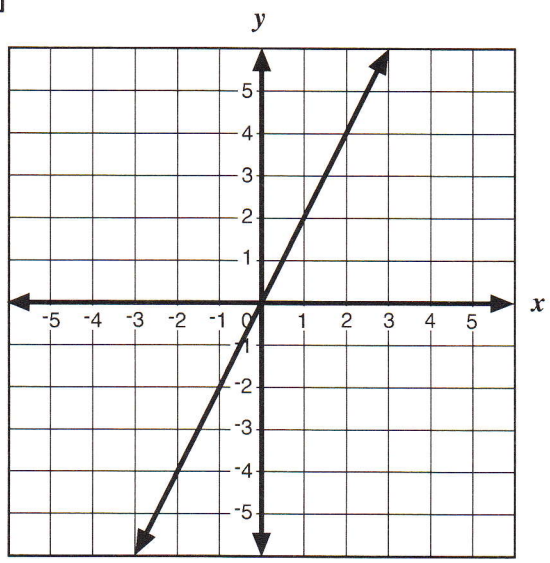
B $3x + y \geq 2$

C $3x + y \leq -2$

D $3x + y \geq -2$

CSA20055

30



Which equation *best* represents the graph above?

A $y = x$

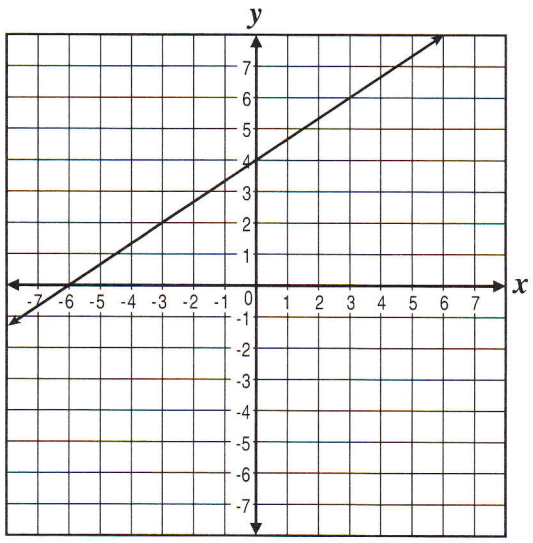
B $y = 2x$

C $y = x + 2$

D $y = 2x + 2$

CSA00508

31 **Which equation represents the line shown in the graph below?**



A $y = \frac{2}{3}x + 4$

B $y = \frac{2}{3}x - 6$

C $y = \frac{3}{2}x + 4$

D $y = \frac{3}{2}x - 6$

CSA10049

32 **What is the x-intercept of the line defined by $-2x + 3y = 12$?**

A 6

B 4

C −4

D −6

CSA00007

33 **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

34 **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

35 **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

36 **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

37 **Which point lies on the line represented by the equation below?**

$$5x + 4y = 22$$

A $\left(-2, \frac{11}{4}\right)$

B $\left(-1, \frac{17}{4}\right)$

C $(2, 3)$

D $(6, 2)$

CSA10148

38 **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

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

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

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

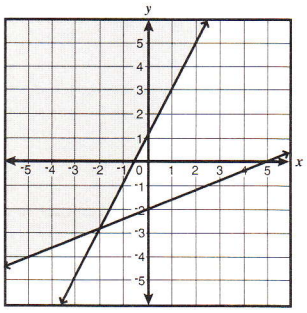
C $y = \frac{4}{5}x + 3$

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

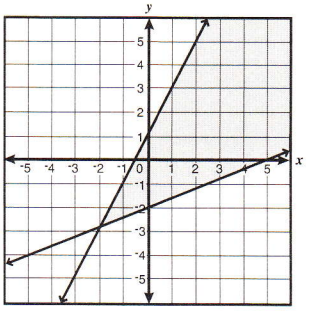
CSA10112

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

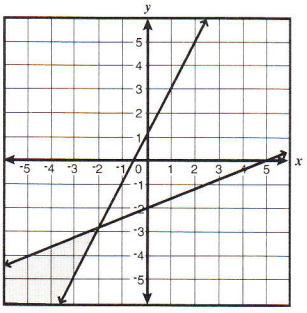
$$\begin{cases} 2x \geq y - 1 \\ 2x - 5y \leq 10 \end{cases}$$



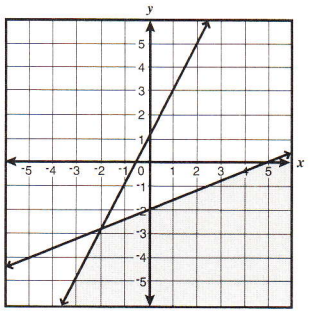
A



C



B



D

CSA00516

41 **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

42 **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

43 **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

44 **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

45 **Members of a senior class held a car wash to raise funds for their senior prom. They charged \$3 to wash a car and \$5 to wash a pick-up truck or a sport utility vehicle. If they earned a total of \$275 by washing a total of 75 vehicles, how many cars did they wash?**

A 25

B 34

C 45

D 50

CSA10187

---

46 **At what point do the lines represented by the equations $2x + y + 1 = 0$ and $4x + y - 3 = 0$ intersect?**

A $(2, 5)$

B $(2, -5)$

C $(-1, 1)$

D $(1, -1)$

CSA20092

---

47 $\dfrac{5x^3}{10x^7} =$

A $2x^4$

B $\dfrac{1}{2x^4}$

C $\dfrac{1}{5x^4}$

D $\dfrac{x^4}{5}$

CSA00303

---

48 $(4x^2 - 2x + 8) - (x^2 + 3x - 2) =$

A $3x^2 + x + 6$

B $3x^2 + x + 10$

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

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

CSA00086

---

49 **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

---

50 **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

51 **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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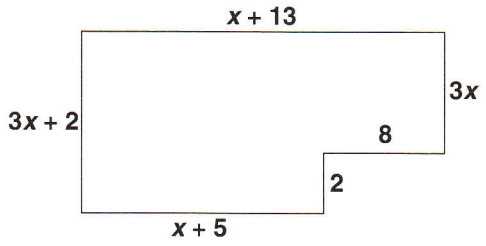
52 **What is the perimeter of the figure shown below, which is not drawn to scale?**



A $5x + 33$

B $5x^3 + 33$

C $8x + 30$

D $8x^4 + 30$

CSA10016

53 **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

---

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

A $x + 3$

B $x - 3$

C $x + 4$

D $x - 4$

CSA00503

---

55 **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

---

56 **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

57 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

---

58 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

---

59 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

---

60 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

---

61 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

---

62 What are the solutions for the quadratic equation $x^2 - 8x = 9$?

A 3

B $3, -3$

C $1, -9$

D $-1, 9$

CSA10063

63 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

64 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

65 **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

66 **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

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

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

B $\{-1 + \sqrt{2}, -1 \quad \sqrt{2}\}$

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

D no real solution

CSA10179

68 **What are the solutions to the equation**

$$3x^2 + 3 = 7x?$$

A $x = \frac{7+\sqrt{85}}{6}$ or $x = \frac{7-\sqrt{85}}{6}$

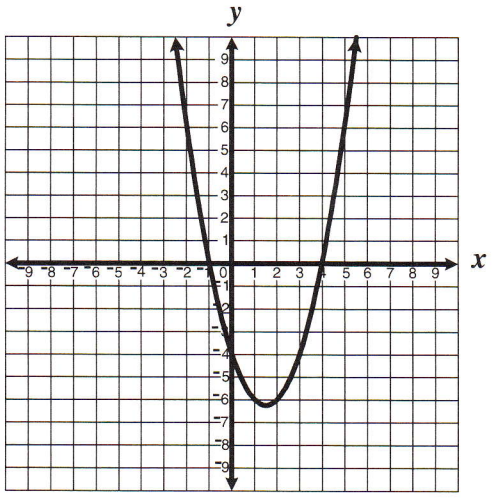
B $x = \frac{-7+\sqrt{85}}{6}$ or $x = \frac{-7-\sqrt{85}}{6}$

C $x = \frac{7+\sqrt{13}}{6}$ or $x = \frac{7-\sqrt{13}}{6}$

D $x = \frac{-7+\sqrt{13}}{6}$ or $x = \frac{-7-\sqrt{13}}{6}$

CSA00224

69 **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

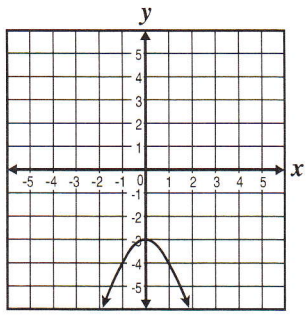
B $x = -4$ only

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

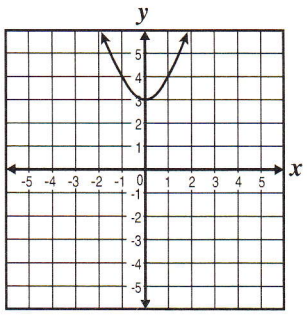
D $x = 1$ and $x = -4$

CSA00514

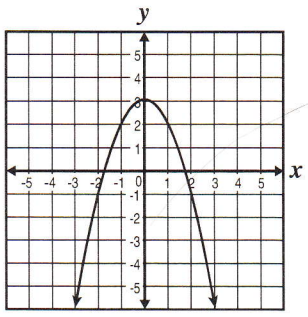
70 Which *best* represents the graph of $y = -x^2 + 3$?



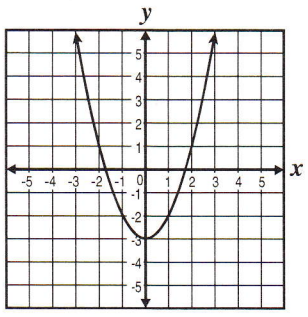
A



C



B



D

CSA00519

71 Which quadratic function, when graphed, has x-intercepts of 4 and -3?

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

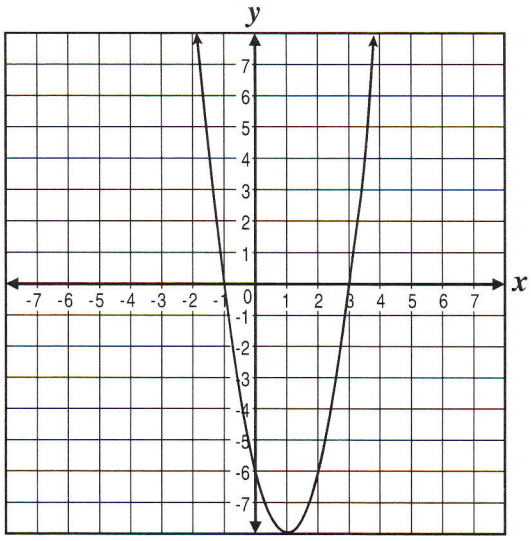
B $y = (x+3)(2x-8)$

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

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

CSA20115

72 What are the real roots of the function in the graph?



A 3

B -6

C -1 and 3

D $-6, -1$, and 3

CSA20120

73 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

74 **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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75 **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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76 **A rectangle has a diagonal that measures 10 centimeters and a length that is 2 centimeters longer than the width. What is the width of the rectangle in centimeters?**

A 5

B 6

C 8

D 12

CSA10200

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

A $\dfrac{x-2y}{3}$

B $\dfrac{x-2y}{3y}$

C $\dfrac{x+2y}{3}$

D $\dfrac{x+2y}{3y}$

CSA00463

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

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

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

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

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

CSA10025

79 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

80 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

81 What is the simplest form of the fraction $\frac{x^2-1}{x^2+x-2}$?

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

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

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

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

CSA20127

82 $\frac{7z^2+7z}{4z+8} \cdot \frac{z^2-4}{z^3+2z^2+z} =$

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