

# Summer 2021 Math Packet

(For Students who completed 7<sup>th</sup> grade Accelerated Math during the 2020 – 2021 school year)

Student's Name: \_\_\_\_\_

Parent's Signature upon Completion: \_\_\_\_\_

The purpose of this packet is to review the concepts you learned in your 7<sup>th</sup> Algebra 1 course and to keep your mathematical mind fresh! Please work on the packet throughout the summer and **not all in one sitting**.

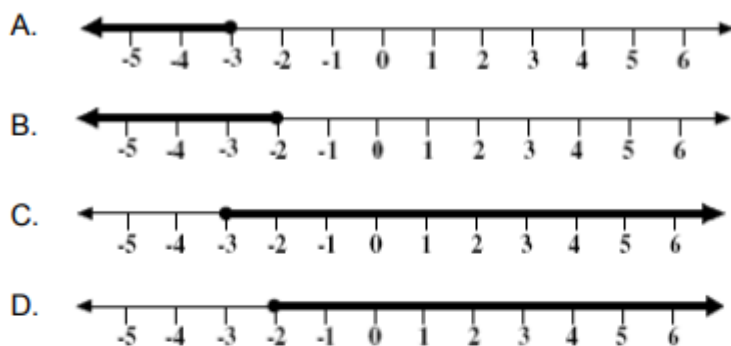
This packet is due on August 31, 2021 and may be submitted electronically or a hard copy. This summer packet will count as a project grade for the 1<sup>st</sup> quarter. Each day the packet is late, 10 points will be deducted from your score and will not be accepted after August 31. **No Extra-Credit** will be awarded if it is turned-In before the due date.

Welcome to Geometry! The following math packet consists of concepts you should already be familiar with. You are expected to have the packet completed by the first day of school and ready to turn it in on August 31, 2021. The packet will be collected for a grade and you will be tested at the end of the first week of school on these concepts. NO CALCULATOR will be allowed on that test, so practice without the use of a calculator. We will be reviewing the packet the first week of school, so make a note of any questions you have.

**WORK MUST BE INCLUDED TO RECEIVE CREDIT FOR YOUR SUMMER PACKET.** Please make sure to staple loose leave paper containing your work to packet. Your problems must be numbered and work should be in order and NEAT. **DO NOT USE PEN!!!**

1. Which graph is the solution to the inequality

$$2x \geq -6$$



2. Which of the following tables does **not** represent a functional relationship?

A

x	y
1	-9
2	-5
-1	9
-2	5

C

x	y
1	9
-1	-9
2	9
-2	-9

B

x	y
1	9
1	-9
2	5
2	-5

D

x	y
1	9
-1	5
2	-9
-2	-5

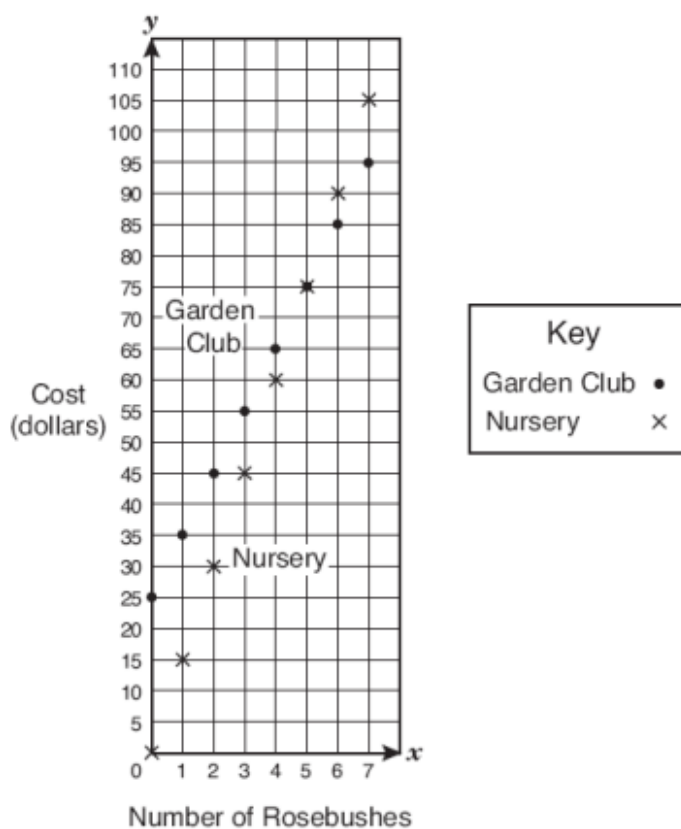
3. Shaniqua is constructing an isosceles triangle to use as a model in her Algebra class. The perimeter of her triangle is 24 inches. Shaniqua uses the equation  $b = 24 - 2s$  to find  $b$ , the length of the triangle's third side, in terms of  $s$ , the length of each of its two congruent sides. What is her equation written in terms of  $s$ ?
- A.  $s = 2(b + 24)$
- B.  $s = \frac{24 + b}{2}$
- C.  $s = 2(b - 24)$
- D.  $s = \frac{24 - b}{2}$
4. Each month Jessie's phone bill includes a \$25 basic fee plus a charge of \$.07 per minute for the number of minutes of long-distance calls she makes. Which equation best describes the total amount of Jessie's monthly phone bill,  $t$ , in terms of  $m$ , the number of minutes of long-distance calls she makes?
- A.  $t = 0.07 + 25m$
- B.  $t = 25 + 0.07m$
- C.  $t = 25(0.07m)$
- D.  $t = 25(7m)$
5. The pressure exerted on the floor by a person's shoe heel depends on the weight of the person and the width of the heel. The formula is

$$P = \frac{1.2W}{H^2} ,$$

where  $P$  is pressure in pounds per square inch,  $W$  is weight in pounds, and  $H$  is heel width in inches. Which of the following shows the pressure formula solved for  $H$ ?

- A.  $H = \pm\sqrt{1.2WP}$
- B.  $H = \pm\sqrt{\frac{1.2W}{P}}$
- C.  $H = \pm\frac{1.2W}{P}$
- D.  $H = \frac{1.2W}{2P}$

6. Paula was given the equation  $y = -x + 3$ . Which of the following is an equivalent representation of this equation?
- A.  $f(x) = -x + 3$
  - B.  $f(y) = x$
  - C.  $y = -f(x) + 3$
  - D.  $f(y) = -x + 3$
7. Dr. Chait is considering joining the Garden Club. If he pays a \$25 membership fee, he can buy rosebushes from the club at a reduced price of \$10 each. If he does not join the club, he can buy rosebushes from a local nursery for \$15 each. The graph below compares the cost of buying rosebushes from the Garden Club and from the local nursery.



How many rosebushes will Dr. Chait have to buy from the Garden Club before he would begin to save money?

- A. 5
- B. 7
- C. 25
- D. 75

8. Diana is driving 182 miles to Orlando for a math convention. She has already driven  $x$  miles of the trip. If Diana drives below 70 miles per hour for the remainder of the trip, which inequality best represents the amount of time in hours,  $t$ , that it will take her to complete the remainder of her drive to Orlando?

A.  $t < \frac{182 - x}{70}$

B.  $t > \frac{70}{182 - x}$

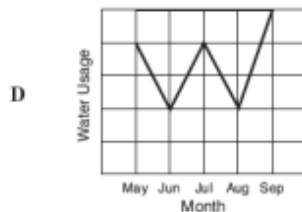
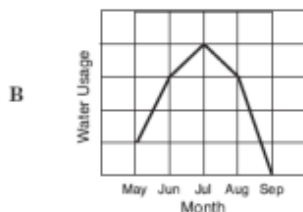
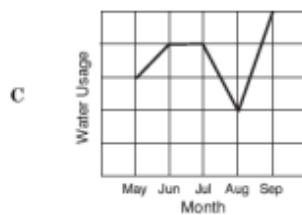
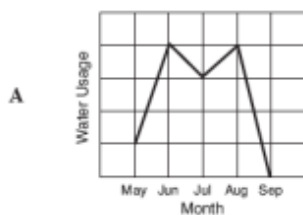
C.  $t < \frac{70}{182 - x}$

D.  $t > \frac{182 - x}{70}$

9. The average daily high temperature for the month of May in Ocala, Florida is approximated by the function  $f(n) = 0.2n + 80$ , where  $n$  is the day of the month. May has 31 days. The maximum daily high temperature occurred on May 31<sup>st</sup>. What was the maximum temperature?

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10. Guy keeps track of the amount of water he uses on his flower garden over the course of the summer. He finds that the less it rains, the more he needs to water the garden to keep his plants healthy and in bloom. This summer the two driest months were June and August, but it rained so heavily in September that he did not have to water his garden at all during that month. Which of the following graphs best represents Guy's water usage this summer?



11. Alyssa is enrolled in a public-speaking class. Each week she is required to give a speech of greater length than the speech she gave the week before. The table below shows the lengths of several of her speeches.

**Alyssa's Speeches**

Week Number	3	4	5	6
Length of Speech (seconds)	150	180	210	240

- If this trend continues, in which week will she give a 12-minute speech?
- A. 22  
B. 12  
C. 15  
D. 24
12. Brock is six feet tall. He climbs a ladder to paint some trim on his house. For each rung that he climbs, Brock is 1.2 feet higher above the ground. Which equation could you use to calculate the distance,  $d$ , from the top of Brock's head to the ground if  $r$  represents the number of ladder rungs he has climbed?
- A.  $d = 1.2r + 6$   
B.  $d = 1.2r$   
C.  $d = r + 6$   
D.  $d = 6r + 1.2$
13. Which sequence uses the algebraic expression  $4n + 5$  to describe the relationship between a term in the sequence and its position,  $n$ , in the sequence?
- A. 4, 9, 14, 19, 24 ...  
B. 4, 8, 12, 16, 20 ...  
C. 9, 13, 17, 21, 25 ...  
D. 9, 10, 11, 12, 13 ...
14. Which expression is equivalent to the following expression?

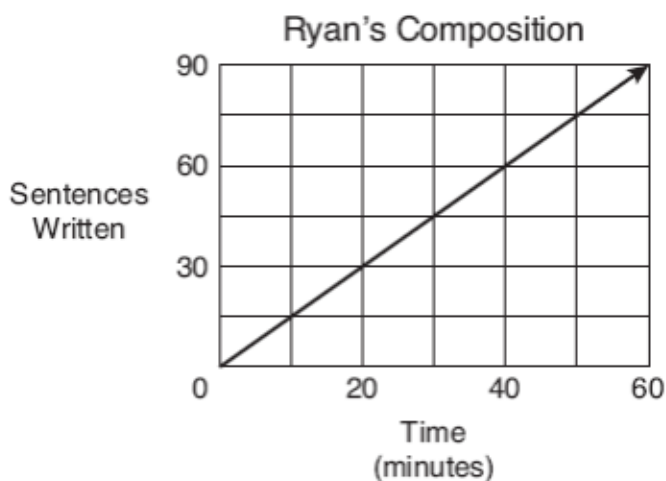
$$\frac{1}{2}x(4x - 6) + 3(x^2 - 1)$$

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

15. What is the slope of the equation  $2x - 5y = 10$ ?

- A.  $-2$
- B.  $\frac{2}{5}$
- C.  $5$
- D.  $-\frac{2}{5}$

16. Ryan is writing a composition for homework. He decides to keep track of the number of sentences he writes compared to the time in minutes he works. The graph below shows the data he collected.



At what rate does Ryan write his composition?

- A. 0.5 sentence per minute
- B. 1 sentence per minute
- C. 1.5 sentences per minute
- D. 2 sentences per minute

17. Which of the following equations describes the same function in the table below?

$x$	$y$
2	8
3	13
4	18
5	23

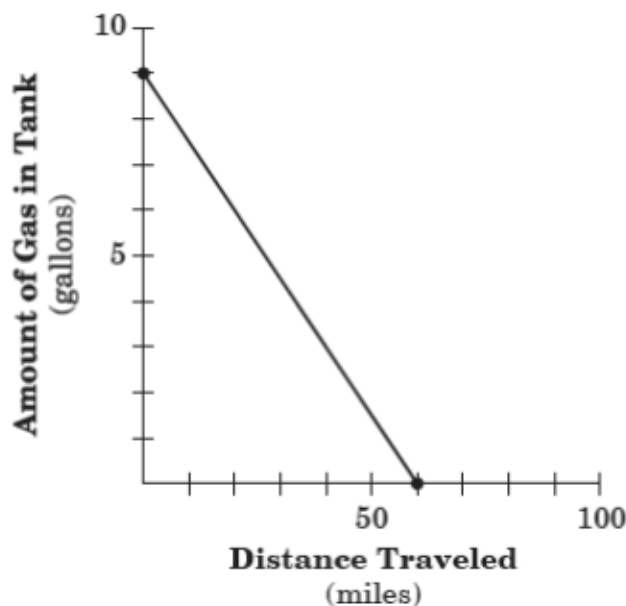
A.  $y = 5x - 2$

B.  $y = \frac{1}{5}x - 2$

C.  $y = 5x + 2$

D.  $y = \frac{1}{5}x + 2$

18. According to the graph, which statement **best** describes the slope?

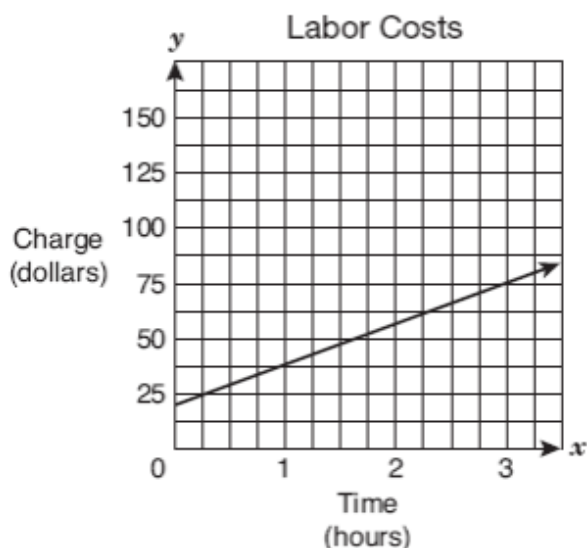


- A. As the distance traveled increases by 20, the amount of gas in the tank decreases by 3.
- B. As the distance traveled decreases by 3, the amount of gas in the tank increases by 20.
- C. As the distance traveled increases by 30, the amount of gas in the tank increases by 2.
- D. As the distance traveled decreases by 20, the amount of gas in the tank decreases by 3.



19. A South Dade farmer knows that the number of potatoes harvested varies directly with the number of potato plants grown. Last year the farmer harvested 189 potatoes from 9 potato plants. If the farmer plants 14 potato plants this year, how many potatoes can he expect to harvest?
- A. 21
  - B. 23
  - C. 294
  - D. 2646
20. To which of the following situations can the function  $y = 5x + 10$  best be applied?
- A. The number of miles a person walks if he walks for 5 hours at the rate of 10 miles per hour
  - B. The total weight on a scale if 5 pounds is placed there initially and a series of 10-pound weights are added to it
  - C. The total wages earned by a waiter who is paid \$5 per hour and earns \$10 in tips
  - D. The combined length of 5 boards, each 10 feet longer than the width of a doorway
21. Gemma and her cousin went to a restaurant for dinner. Gemma's dinner cost \$5 more than her cousin's. If their combined bill was under \$25, which inequality best describes the cost of their dinners?
- A.  $x + 5 < 25x$
  - B.  $x + (x + 5) < 25$
  - C.  $x + (x + 25) < 5$
  - D.  $x - (x + 5) < 25$
22. The population of Williston is currently 15,400 people. If the population increases at an average rate of 325 people per year, which equation could be used to find the approximate number of years it will take for the population to reach 18,000 people?
- A.  $15,400 + 325n = 18,000$
  - B.  $325n = 18,000$
  - C.  $15,400n + 325 = 18,000$
  - D.  $15,400n = 18,000$

23. Dosset's Mobile Service Station uses the graph below to determine how much a mechanic should charge for labor for automobile repairs.



If the labor charge on an automobile repair bill was \$67.50, for approximately how many hours,  $h$ , did the mechanic work?

- A.  $2.25 < h < 2.50$
- B.  $2.75 < h < 3.00$
- C.  $2.00 < h < 2.25$
- D.  $2.50 < h < 2.75$
24. The gas tank in Mina's car holds 15 gallons. Her car gets between 25 and 30 miles to the gallon. If Mina fills up the gas tank and then drives until she runs out of gas, what is the least number of miles she can drive?
- A. 300 mi
- B. 375 mi
- C. 405 mi
- D. 450 mi

25. The cost of renting a van for one day includes a flat rental fee plus a charge for each mile the van is driven while it is rented. A van that is driven 107 miles costs \$97.15. A van that is driven 127 miles costs \$106.15. What is the flat rental fee?
- A. \$19.00  
B. \$20.00  
C. \$45.00  
D. \$49.00
26. At a linen sale Mrs. Earle bought twice as many pillowcases for \$2 each as sheets for \$5 each. If she spent less than \$40, not including tax, what is the maximum number of pillowcases she could have purchased?
- A. 3  
B. 4  
C. 6  
D. 8
27. Given the system of equations below:

$$3x - 2y = 12$$

$$4x - y = 11$$

What is the value of  $y$  in the solution?

- A. -3  
B. -2  
C. 2  
D. 3

28. The area of a parallelogram is  $35p^6q^6$  square units. If the base of the parallelogram measures  $5pq^2$  units, what is the height of the parallelogram? ( $p > 0$  and  $q > 0$ )
- A.  $7p^5q^4$  units
  - B.  $7p^6q^3$  units
  - C.  $30p^5q^4$  units
  - D.  $30p^6q^3$  units
29. The side length of a square is  $4x^3yz^4$  units. What is the area of the square?
- A.  $8x^6y^2z^8$  square units
  - B.  $8x^9yz^{16}$  square units
  - C.  $16x^6y^2z^8$  square units
  - D.  $16x^9yz^{16}$  square units
30. Julia estimated that it would take her 4 hours to write a 4-page report. It actually took her only 38 minutes to write the first page of the report. If she keeps writing at this same rate, by how many hours and minutes did she overestimate the time it would take her to complete the report?
- A. 1 hour 28 minutes
  - B. 2 hours 8 minutes
  - C. 2 hours 28 minutes
  - D. 2 hours 32 minutes

31. A student incorrectly solved the equation  $3(2x + 6) - 4 = 14$  as shown below.

Step 1:  $6x + 6 - 4 = 14$

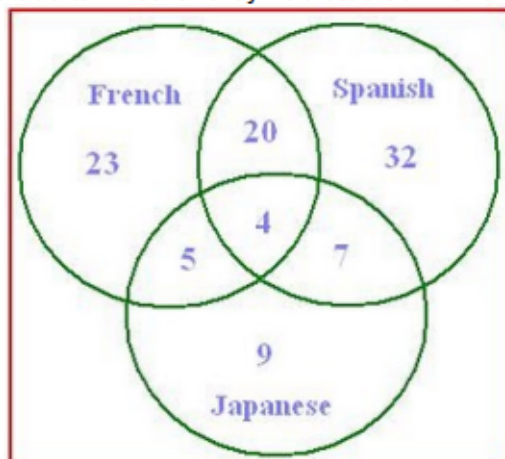
Step 2:  $6x + 2 = 14$

Step 3:  $6x = 12$

Step 4:  $x = 2$

In what step did the student first make a mistake?

- A. In Step 1, the student should have multiplied both terms in parentheses by 3, not just the first term.
  - B. In Step 2, the student should have subtracted 4 from the right side of the equation, not the left side.
  - C. In Step 3, the student should have added 2 to both sides of the equation instead of subtracting 2.
  - D. In Step 4, the student should have multiplied both sides of the equation by 6 instead of dividing by 6.
32. Kroner asked 100 adults whether they had studied French, Spanish or Japanese in school.



According to the Venn diagram how many adults had studied French and Spanish but not Japanese?

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33. Let  $A = \{0, 1, 2, 3, 4, 5\}$  and  $B = \{6, 7, 8, 9\}$

How many distinct pairs are in  $A \times B$ ?

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34. There are 32 students in the 10<sup>th</sup> grade class. There are 15 of those students on the basketball team and 23 of those students in the drama class. Which diagram correctly shows the number of students on the basketball team, in the drama class, and in both of these activities?

A.



C.



B.



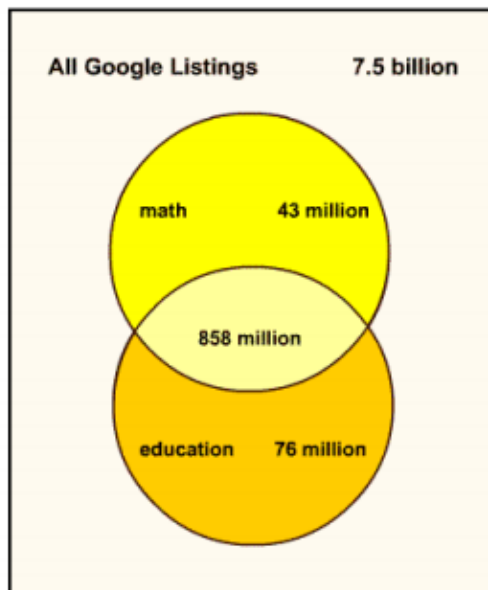
D.



35. Given the set  $A = \{1, 2, 3\}$  and the set  $B = \{-3, -2, -1, 0\}$ , what is the total number of elements in  $A \times B$ ?

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36. The Venn diagram below shows the number of web pages that were found by using the keywords “math” and “education” on Google in spring 2005. How many millions of web sites were found that contain the work “math”?



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37. Twenty-eight girls went camping. The girls were able to choose to participate in volleyball and swimming. Fourteen girls went swimming, 5 participated in both activities, and 4 girls did neither. How many girls only played volleyball?

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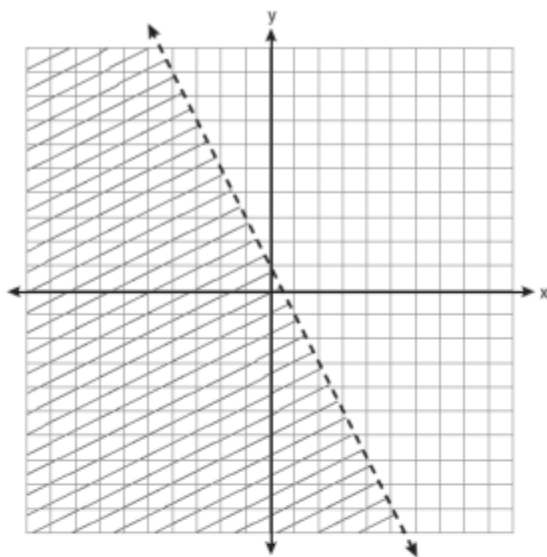
38. Let  $C = \{1, 4, 5, 7, 9, 10\}$ ,  $A = \{1, 9, 17\}$ , and  $T = \{9, 10, 13\}$ . What is the greatest value in the set  $(A \cup T) \cap C$ ?

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39. Which expression represents  $\frac{(2x^2)(8x^6)}{4x^6}$  in simplest form?
- A.  $x^2$
  - B.  $x^9$
  - C.  $4x^2$
  - D.  $4x^9$
40. Which property is illustrated by the equation  $ax + ay = a(x + y)$ ?
- A. Associative
  - B. Commutative
  - C. Distributive
  - D. Identity
41. The equations  $5x + 2y = 48$  and  $3x + 2y = 32$  represent the money collected from school concert ticket sales during two class periods. If  $x$  represents the cost for each adult ticket and  $y$  represents the cost for each student ticket, what is the cost for each adult ticket?
- A. \$20
  - B. \$10
  - C. \$8
  - D. \$4
42. Given: Set  $A = \{(-2, -1), (-1, 0), (1, 8)\}$  and Set  $B = \{(-3, -4), (-2, -1), (-1, 2), (1, 8)\}$ . What is  $A \cap B$ ?
- A.  $\{(1, 8)\}$
  - B.  $\{(-2, -1)\}$
  - C.  $\{(-2, -1), (1, 8)\}$
  - D.  $\{(-3, -4), (-2, -1), (-1, 2), (-1, 0), (1, 8)\}$



43. Which inequality is represented by the graph below?



A.  $y < 2x + 1$

B.  $y < -2x + 1$

C.  $y < \frac{1}{2}x + 1$

D.  $y < -\frac{1}{2}x + 1$

44. 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

45. Which expression is equivalent to  $x^6 \cdot x^2$ ?

A.  $x^4 x^3$

B.  $x^5 x^3$

C.  $x^7 x^3$

D.  $x^9 x^3$

46. The Langiappe restaurant has used the following equation to calculate the number of sandwich trays needed for a very large party.

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

A.  $8x = 5$

B.  $8x = 17$

C.  $29x = 5$

D.  $29x = 17$

47. The total cost  $f(d)$  in dollars of renting a sailboat for  $d$  days is given by the function

$$f(d) = 120 + 60d.$$

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

A. 2

B. 4

C. 6

D. 8

48. 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?

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49. Mike'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:**  $n = 10$

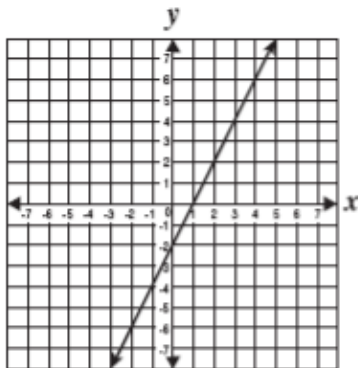
Which statement about Mike's solution is true?

- A. Mike's solution is correct.
- B. Mike made a mistake in Step 1.
- C. Mike made a mistake in Step 3.
- D. Mike made a mistake in Step 5.

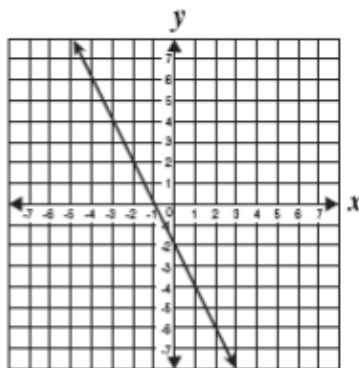
50. What is the  $y$ -intercept of the graph of  $4x + 2y = 12$ ?

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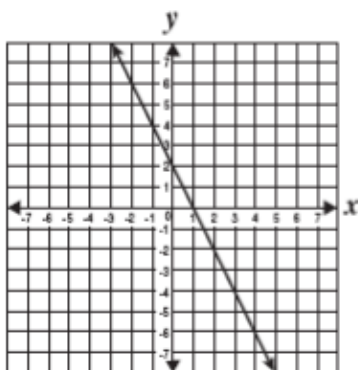
51. Which *best* represents the graph of  $y = 2x - 2$ ?



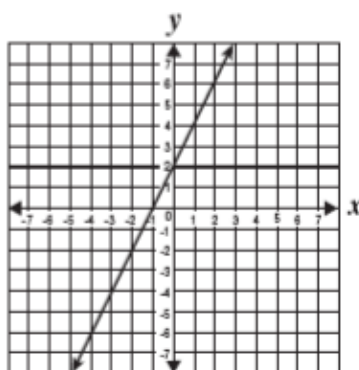
A



C



B



D

52. Harry determined that every time he tapped his wand the sound increased 4 decibels. He noticed that after tapping his wand three times, the sound measured 34 decibels. Which equation best represents the sound when  $w$  represents a move of the wand and  $s$  represents the loudness of the sound?

A.  $s = 4w - 22$

B.  $s = 4w + 22$

C.  $s = 4w - 43$

D.  $s = 4w = 43$

53. 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.  $c = 5h - 5$
54.  $(4x^2 - 2x + 8) - (x^2 + 3x - 2) =$
- A.  $3x^2 + x + 6$
- B.  $3x^2 + x + 10$
- C.  $3x^2 - 5x + 6$
- D.  $3x^2 - 5x + 10$
55. The equation of line  $j$  is  $6x + 5y = 3$ , and the equation of line  $q$  is  $5x - 6y = 0$ . Which statement about the two lines is true?
- A. Lines  $j$  and  $q$  have the same  $y$ -intercept.
- B. Lines  $j$  and  $q$  are parallel.
- C. Lines  $j$  and  $q$  have the same  $x$ -intercept.
- D. Lines  $j$  and  $q$  are perpendicular.

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

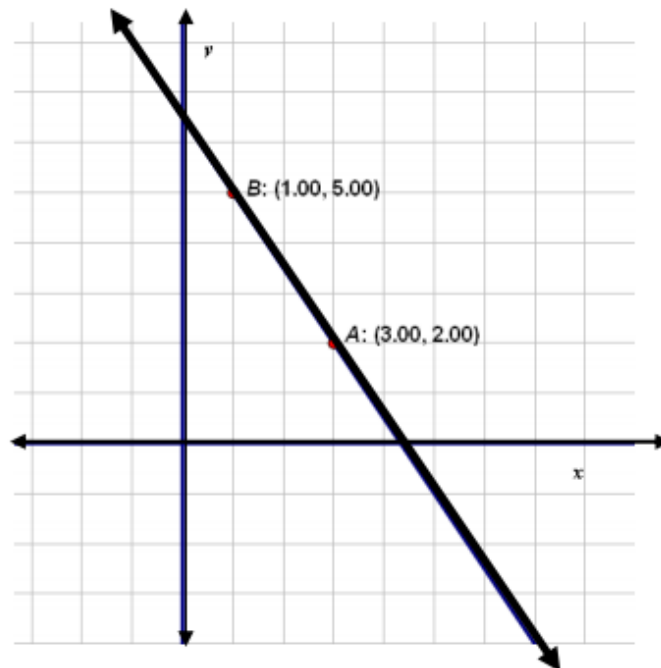
A.  $2x^2 - 4x$

B.  $2x^2 - 8x$

C.  $8x^2 + 4x$

D.  $8x^2 - 8x$

57. Shirley graphed the line shown on the coordinate plane below.



What is the x-coordinate of the point at which this line intersects the x-axis?

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58. The distance traveled by a marble on a flat table as it rolls in a straight line is determined by the formula:

$$s = ut + \frac{1}{2}at^2,$$

where

$s$  = Distance traveled

$u$  = Initial Velocity

$t$  = Time elapsed

$a$  = Acceleration

Which of the following shows the distance traveled formula solved for  $a$ ?

A.  $a = \frac{2s - 2ut}{t^2}$

B.  $a = \frac{2s - ut}{t^2}$

C.  $a = \frac{2s - 2u}{t}$

D.  $a = \frac{s - ut}{t^2}$

59. Which is the line parallel to the line  $y = 8x - 2$ ?

A.  $y = 2x - 8$

B.  $y = -1/8x + 3$

C.  $y = 4 + 8x$

D.  $2y = 8x + 3$

60. Find an equation for the line with y-intercept 3 that is perpendicular to the line  $3y = 2x - 4$ .

A.  $2y = 6 - 3x$

B.  $2y = 3x + 6$

C.  $3y = 9 - 2x$

D.  $3y = 2x + 9$

61. At a local grocery store, watermelons are sold for \$4 each plus an additional \$0.25 per pound. Write a function that describes the relationship between  $x$ , the number of pounds of a watermelon, and  $f(x)$ , the total cost of the watermelon.

A.  $f(x) = 4.25x$   
B.  $f(x) = 4 + 0.25x$   
C.  $f(x) = 4(0.25x + 1)$   
D.  $f(x) = 4x(0.25x + 4)$

62. If  $f(x) = \frac{3-x^2}{3-x}$ , what is  $f(2)$ ?

A. -2  
B. -1  
C. 1  
D. 2

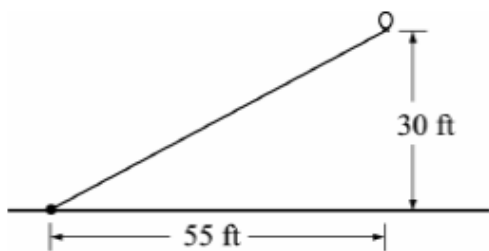
63. What is the solution to the inequality below?

$$2x - 7 \geq 15$$

A.  $x \leq 8$   
B.  $x \geq 8$   
C.  $x \leq 11$   
D.  $x \geq 11$



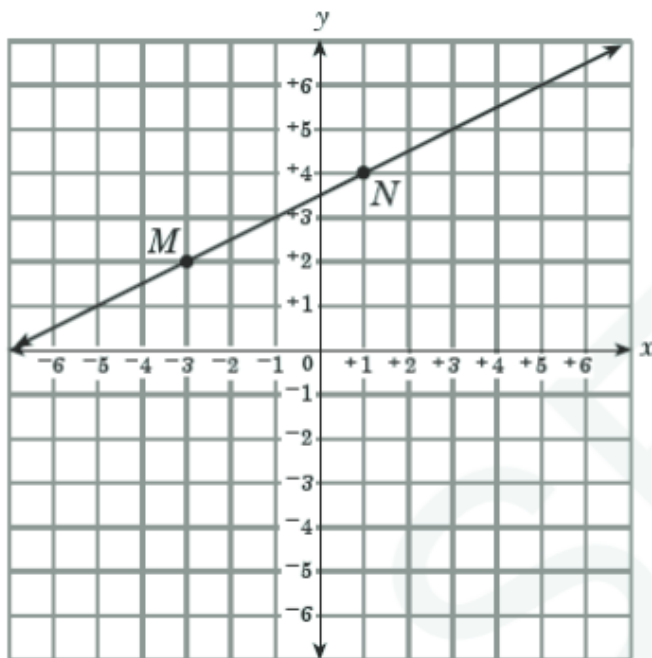
64. A long string with a balloon at the end was tied to the ground. After a breeze came up, the balloon was 55 feet to the right of where it was tied and 30 feet above the ground, as shown in the figure below.



What is the slope of the line between the balloon and the point where it was tied?

- A.  $\frac{6}{11}$
- B.  $\frac{11}{6}$
- C. 30
- D. 55
65. The time that it takes to fill a fish tank depends upon the rate at which the water is flowing. It takes 40 minutes to fill the fish tank at the rate of 3 gallons per minute. How many minutes will it take to fill the fish tank at the rate of 4 gallons per minute?
- A.  $\frac{12}{40}$
- B. 30
- C. 50
- D.  $53\frac{1}{3}$

66. Which is an equation of a line that is parallel to line  $\overleftrightarrow{MN}$ ?



- A.  $2x - y = 3$   
B.  $x - 2y = 3$   
C.  $8x + 4y = 4$   
D.  $9x + 18y = -9$
67. A group of 3 children and 2 adults pay a total of \$120 to take a karate class. A group of 5 children and 1 adult take the same karate class for \$95. What is the total cost for 1 child and 1 adult to take the karate class?
- A. \$60  
B. \$55  
C. \$51  
D. \$48

68. A computer is purchased for \$1,200 and depreciates at \$140 per year. Which linear equation represents the value,  $V$ , of the computer at the end of  $t$  years?

- A.  $V=1,200-140t$
- B.  $V= 140t$
- C.  $V= 140t-1,200$
- D.  $V= 140(1,200 -t)$

69. Simplify  $\frac{14c^3d^2 - 21c^2d^3}{14cd}$

- A.  $c^2 - \frac{3cd}{2}$
- B.  $c^2 - \frac{3c^2d}{2}$
- C.  $c^2 - 21c^2d^3$
- D.  $c^2d - \frac{3cd^2}{2}$

70. A function is completely defined by the table below.

$x$	$y$
0	5
2	10
10	2
-3	9

What is the value of the greatest element in the domain?

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

- A.  $-9 - 2x = 14x$
- B.  $-9x + 1 = 14x$
- C.  $-9x - 2 = 14x$
- D.  $12x - 1 = 14x$

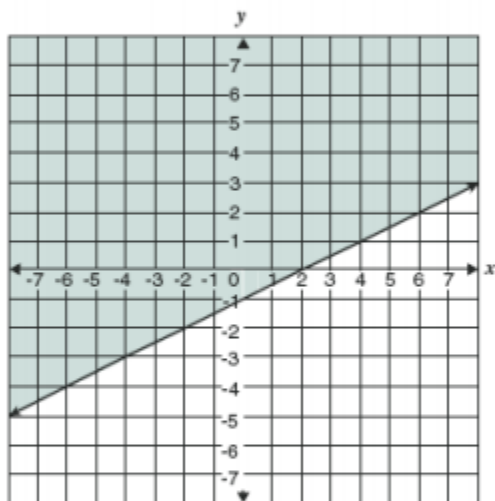
72. What is the value of  $x$  in the equation:  $6(4x + 5) = 3(x + 8) + 3$

- A.  $-3$
- B.  $-\frac{1}{7}$
- C.  $\frac{1}{3}$
- D.  $7$

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

- A.  $x > 9$
- B.  $x > 19$
- C.  $x < 9$
- D.  $x < 19$

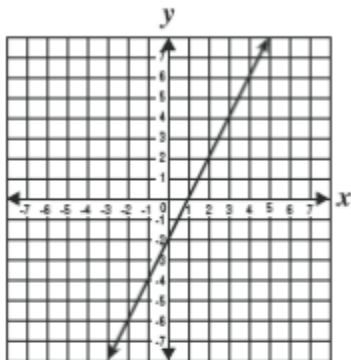
74. Which inequality is shown on the graph below?



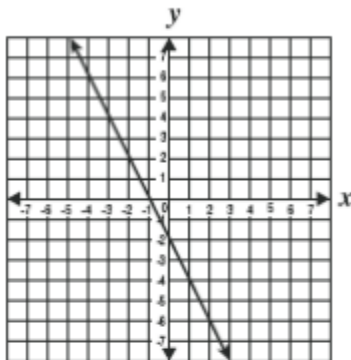
- A.  $y < \frac{1}{2}x - 1$
- B.  $y \leq \frac{1}{2}x - 1$
- C.  $y > \frac{1}{2}x - 1$
- D.  $y \geq \frac{1}{2}x - 1$

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

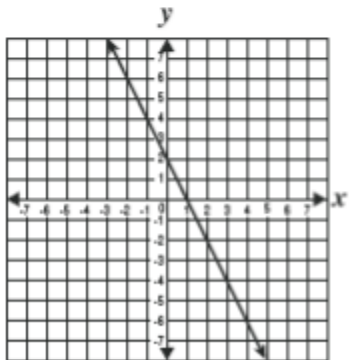
A



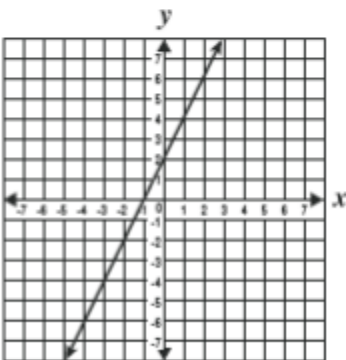
C



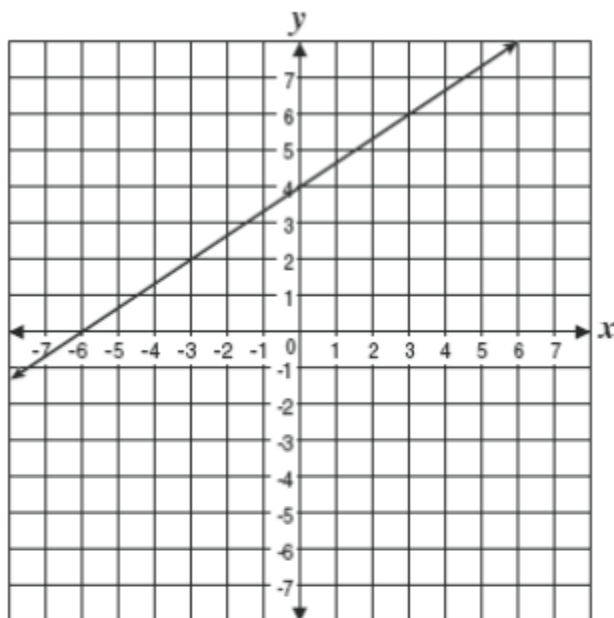
B



D



76. Jorge graphed the line shown below.



What is the slope of the line?

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77. Which expression represents  $y^4 - 36$  in simplest factored form?

- A.  $(y^2 + 4)(y^2 - 9)$
- B.  $(y^2 + 4)(y - 3)(y + 3)$
- C.  $(y^2 + 6)(y^2 - 6)$
- D.  $(y^4 - 36)(y + 1)$





78. What is the simplest form of the expression below?

$$4\sqrt{2} + 3\sqrt{2} - 5\sqrt{2}$$

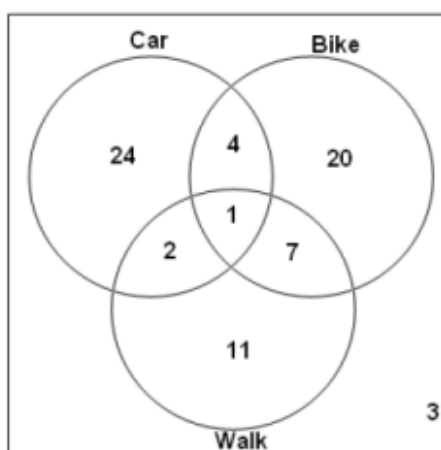
A.  $2\sqrt{2}$

B.  $2\sqrt{6}$

C.  $7\sqrt{2}$

D.  $12\sqrt{2}$

79. The mode of transportation to school of 9<sup>th</sup> grade students is shown in the diagram below.



How many students took this survey?

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80. Solve  $x^2 - 7x + 10 = 28$ .

A.  $\{-4, -7\}$

B.  $\{-2, 9\}$

C.  $\{5, 2\}$

D.  $\{30, 33\}$

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

- A.  $\{-2, -8\}$
- B.  $\{-2, 8\}$
- C.  $\{2, -8\}$
- D.  $\{2, 8\}$

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

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

83. If  $y \neq 0$ , then  $\frac{3x + 12y}{6y} = ?$

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

84. Solve  $6 - 3(4x - 5) = 7$ .

- A.  $-\frac{4}{3}$
- B.  $\frac{7}{6}$
- C.  $\frac{11}{6}$
- D.  $\frac{7}{3}$

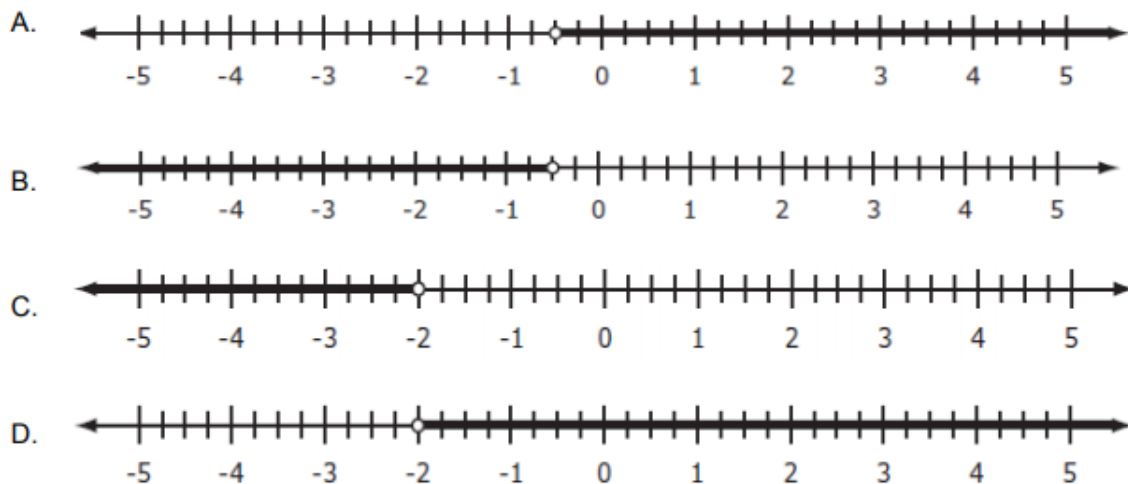
85. The formula below illustrates how to calculate body mass index ( $B$ ), using weight ( $w$ ) and height ( $h$ ).

$$B = \frac{703w}{h^2}$$

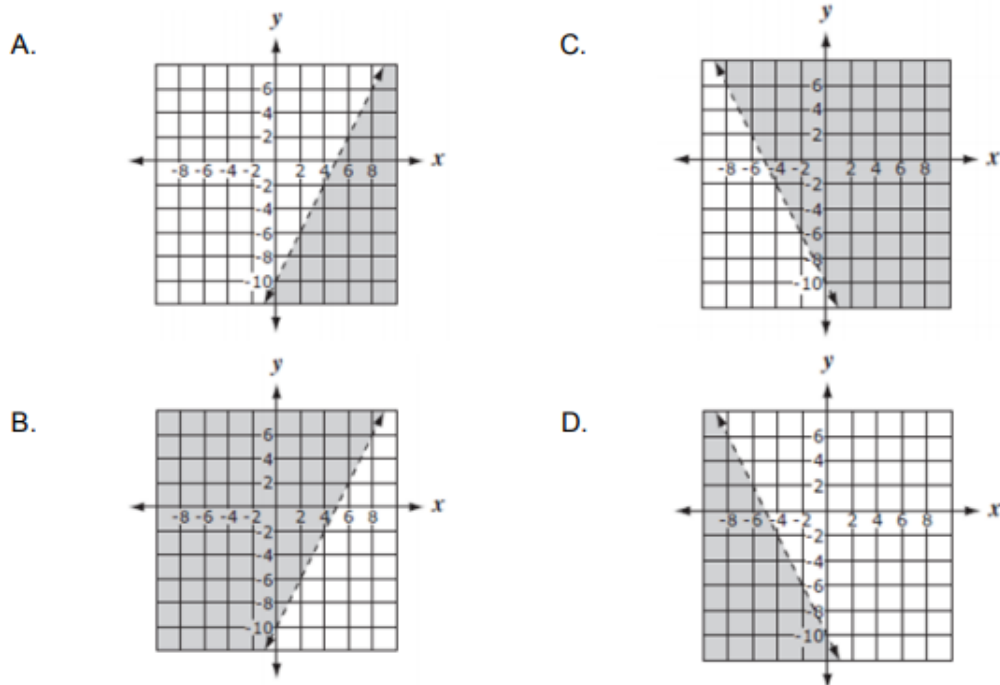
Which of the following shows this equation correctly solved for  $w$ ?

- A.  $w = Bh^2 - 703$
- B.  $w = B + h^2 - 703$
- C.  $w = \frac{Bh^2}{703}$
- D.  $w = \frac{703B}{h^2}$

86. Which graph represents the solution set for  $\frac{1}{2} - \frac{2}{3}x < \frac{5}{6}$ ?

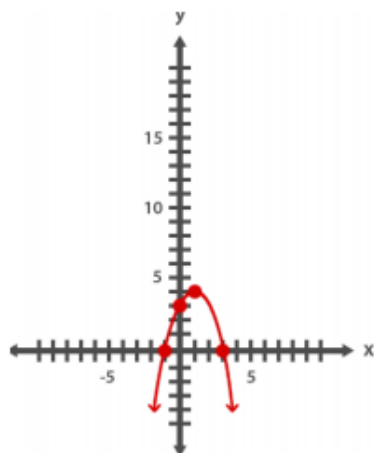


87. Which graph best represents  $2x - y < 10$ ?

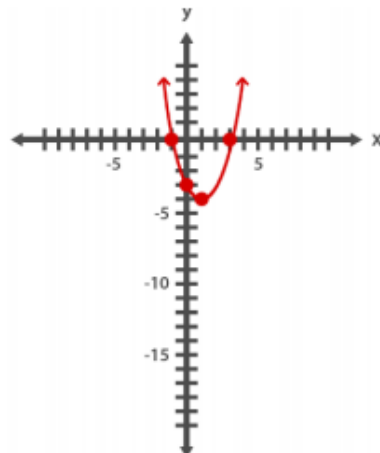


88. Which of the following is the graph of the function  $y = x^2 + 2x - 3$ ?

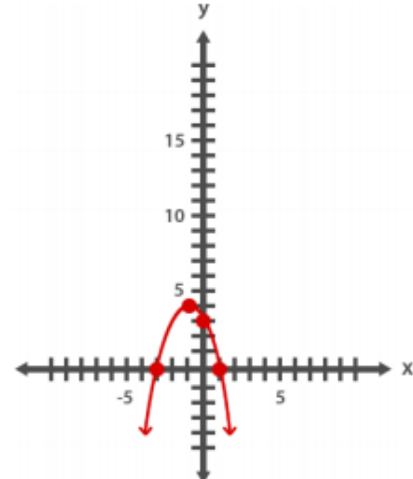
A.



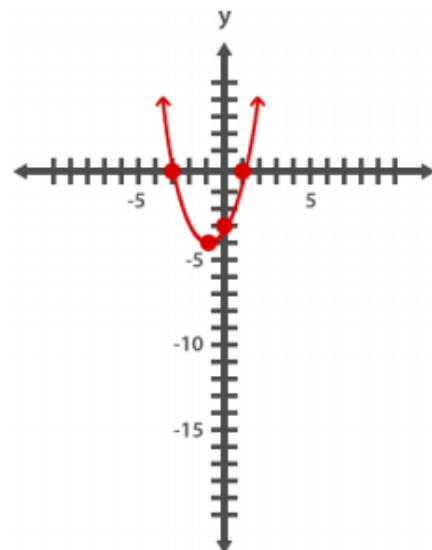
C.



B.



D.



89. Rogelio divides a trinomial by a monomial, as shown below.

$$\frac{3x^4 + 9x^2 + 15x}{3x}$$

Which of the following is the correct result?

- A.  $x^3 + 9x^2 + 15x$
  - B.  $x^4 + 3x^2 + 5x$
  - C.  $x^3 + 3x + 5$
  - D.  $3x^4 + 9x^2 + 5$
90. Yanet needs to simplify the expression below before she substitutes values for  $x$  and  $y$ .

$$\frac{x^{18}y^{12} + x^9y^8}{x^3y^4}$$

If  $x \neq 0$  and  $y \neq 0$ , which of the following is a simplified version of the expression above?

- A.  $x^9y^5$
  - B.  $x^{24}y^{16}$
  - C.  $x^6y^3 + x^3y^2$
  - D.  $x^{15}y^8 + x^6y^4$
91. The function below can be used to describe the path of a bird flying through the air.

$$f(x) = x^2 - 4x - 32$$

Which of the following shows the correct factorization of this function  $f(x) = 0$ ?

- A.  $(x + 4)(x + 8) = 0$
- B.  $(x + 4)(x - 8) = 0$
- C.  $(x - 4)(x - 8) = 0$
- D.  $(x - 4)(x + 8) = 0$

92. Yanice needs to solve the problem below using the quadratic formula.

$$x^2 + 8x + 7 = -8$$

Which use of the following shows the quadratic formula being used correctly to determine the solutions for this problem?

A.  $x = \frac{-8 \pm \sqrt{8^2 - 4(1)(7)}}{2(1)}$

B.  $x = \frac{-8 \pm \sqrt{8^2 - 4(1)(-8)}}{2(1)}$

C.  $x = \frac{8 \pm \sqrt{8^2 - 4(1)(15)}}{2(1)}$

D.  $x = \frac{-8 \pm \sqrt{8^2 - 4(1)(15)}}{2(1)}$

93. Avis used a quadratic function to solve a problem. The factored form of the function is show below.

$$(4x + 3)(6x - 3) = 0$$

What is the positive solution to the problem?

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94. Let  $A = \{f, c, a, t\}$  and  $B = \{f, l, a\}$ . Which of the following represents the intersection of A and B?

A.  $\{f, a\}$

B.  $\{c, t, l\}$

C.  $\{c, a, t, l\}$

D.  $\{f, c, a, t, l\}$

95. Let  $G = \{1, 3, 5\}$  and  $H = \{5, 9\}$ . Which of the following represents the cross product of  $G$  and  $H$ ?

- A.  $G \times H = \{5, 9, 15, 25, 27, 45\}$
- B.  $G \times H = \{(1,5), (1,9), (3,15), (3,27), (5,25), (5,45)\}$
- C.  $G \times H = \{(5,1), (5,3), (5,5), (9,1), (9,3), (9,5)\}$
- D.  $G \times H = \{(1,5), (1,9), (3, 5), (3,9), (5, 5), (5,9)\}$

96. Shelly has been asked to factor the following expression completely.

$$36y - 81x^2y$$

Which answer choice shows her completely factored expression?

- A.  $y(6 + 9x)(6 - 9x)$
- B.  $9y(2 + 3x)(2 - 3x)$
- C.  $y(36 - 81x^2)$
- D.  $9y(4 - 9x^2)$

97. Kerry wants to simplify the following:

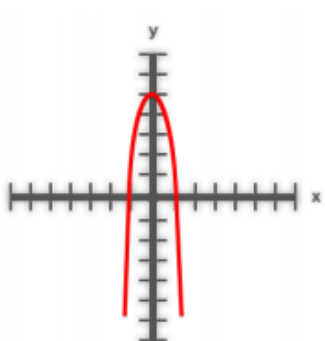
$$\frac{20x^2 + 5x}{5x}$$

Which of the following is the correct result?

- A.  $4x$
- B.  $4x + 1$
- C.  $20x^2$
- D.  $20x^2 + 1$



98. What is the range of the relation shown in the graph below?



- A. All  $y \leq 5$
- B. All  $x \leq 5$
- C. All values of  $y$
- D. All values of  $x$

99. The surface area,  $S$ , of a cylinder is calculated using the formula  $S = 2\pi r l + 2\pi r^2$ . Which equation is equivalent to this formula solved for  $l$ , the length of the cylinder?

- A.  $l = \frac{S-1}{r}$
- B.  $l = \frac{S-2\pi r}{2\pi r^2}$
- C.  $l = \frac{S-2\pi r}{r}$
- D.  $l = \frac{S-2\pi r^2}{2\pi r}$

100. What is the value of  $x$  in the equation shown below?

$$\frac{2x^{\frac{3}{2}}}{x} + x^{\frac{1}{2}} + 6\sqrt{x} = 36$$

- A. 2
- B. 4
- C. 8
- D. 16