

Student Name:

Algebra I-TEST 3



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Algebra I

DIRECTIONS

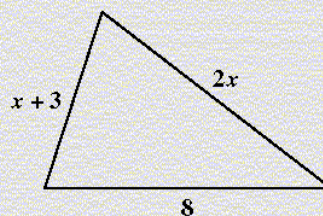
Read each problem carefully. Then work the problem, find your answer among the answer choices.

SAMPLE A

What value of x makes the equation $2x + 1 = 7$ true?

- A 2
- B 3
- C 4
- D 5

SAMPLE B



Which of these is equivalent to the perimeter of this triangle?

- A $2x^2 + 8$
- B $2x^2 + 11$
- C $3x + 8$
- D $3x + 11$

1. A certain function is represented by $g(x) = 4 - 3x$. If the range of this function is $\{-5, 4, 7\}$, what is the domain of the function?

- A $\{15, -8, -17\}$
 - B $\{3, 0, -1\}$
 - C $\{-3, 0, 1\}$
 - D $\{-11, -8, -17\}$
-

2. What is the sum of the polynomials shown below?

$$\begin{array}{r} 2x^2 - 3x + 5 \\ -x^2 + 6x - 8 \end{array}$$

- A $3x^2 - 9x + 13$
 - B $x^4 + 3x^2 - 3$
 - C $3x^2 + 3x - 3$
 - D $x^2 + 3x - 3$
-

3. In Ryan's class of 27 students, 15 are boys and 12 are girls. What part of the class is girls?

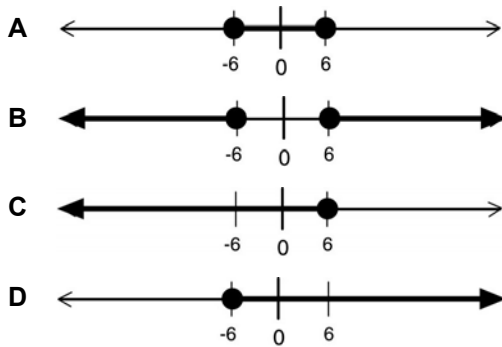
- A $\frac{4}{9}$
 - B $\frac{5}{9}$
 - C $\frac{4}{5}$
 - D $\frac{5}{4}$
-

4. Which of these is a prime factor of $m^2 - 18m + 30$?

- A $m - 5$
 - B $m + 5$
 - C $m^2 + 6$
 - D $m^2 - 18m + 30$
-

5. Which graph BEST represents the solution set to the inequality?

$$|x| + 4 \leq 10$$



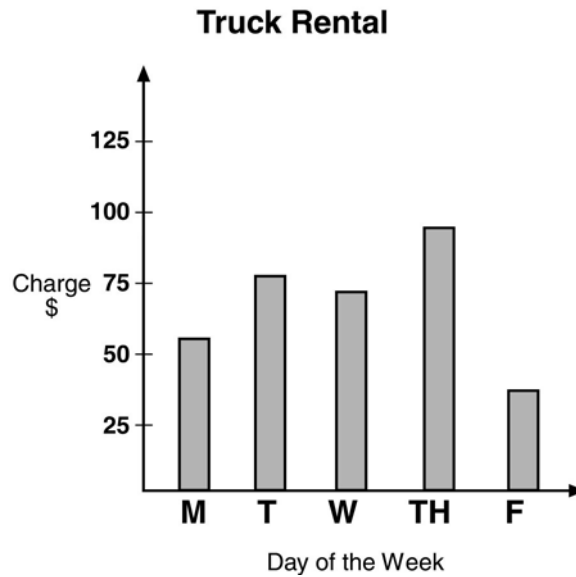
6. The formula below can be used to determine I , the amount of simple interest earned, on p , the amount saved, at an interest rate of r percent for t years.

$$I = prt$$

How much interest will be earned on an amount of \$200 saved at an interest rate of 5% for 4 years?

- A \$40
 - B \$80
 - C \$400
 - D \$4000
-

7. John rented a truck for a week to move across the country to his new home. The truck rental company charged \$19.95 per day and an additional \$0.25 for each mile the truck was driven. The graph shows the daily charge for the rental.



What is the *domain* of this graph?

- A {1, 2, 3, 4, 5}
 - B {M, T, W, TH, F}
 - C {25, 50, 75, 100, 125}
 - D {58, 76, 71, 89, 39}
-

8. If matrix $A = \begin{bmatrix} 3 & 1 \\ -2 & 6 \end{bmatrix}$ and matrix $B = \begin{bmatrix} 2 & -1 \\ -3 & 3 \end{bmatrix}$, which of the following represents $A + B$?

A $\begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$

B $\begin{bmatrix} -1 & -2 \\ -1 & -3 \end{bmatrix}$

C $\begin{bmatrix} 5 & 0 \\ -5 & 9 \end{bmatrix}$

D $\begin{bmatrix} 3 & 0 \\ -22 & 20 \end{bmatrix}$

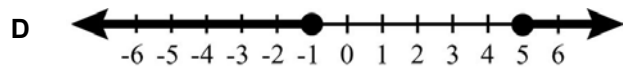
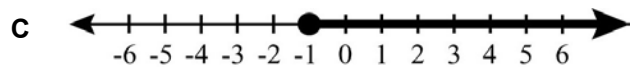
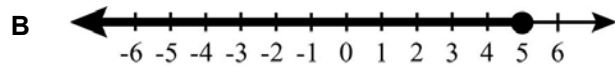
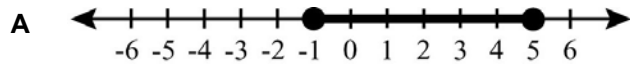
9. What is the *sum* of the solutions to the equation shown below?

$$x^2 - 12 = 4$$

- A -4
B 0
C 4
D 12
-

10. Which of these BEST represents the solution of the inequality shown below?

$$|x - 2| \leq 3$$



-
11. Doug and Laura sold cans of soda to raise money for a school dance. Doug sold 4 less than 3 times as many cans as Laura. Together they sold 300 cans. Which system of equations could be used to determine d , the number of cans Doug sold, and l , the number of cans Laura sold?

A $d = 4 - 3l$
 $d + l = 300$

B $d = 3l - 4$
 $d + 3l = 300$

C $d = 3l - 4$
 $d + l = 300$

D $d = 3l + 4$
 $d + l = 300$

12. Matrix F is shown below.

$$F = \begin{bmatrix} -1 & -1 & -1 \\ 0 & 0 & 0 \\ -1 & -1 & -1 \end{bmatrix}$$

What is $-F$?

A $\begin{bmatrix} -1 & -1 & -1 \\ 0 & 0 & 0 \\ -1 & -1 & -1 \end{bmatrix}$

B $\begin{bmatrix} 1 & 1 & 1 \\ 0 & 0 & 0 \\ 1 & 1 & 1 \end{bmatrix}$

C $\begin{bmatrix} 1 & 1 & 1 \\ -1 & -1 & -1 \\ 1 & 1 & 1 \end{bmatrix}$

D $\begin{bmatrix} -2 & -2 & -2 \\ -1 & -1 & -1 \\ -2 & -2 & -2 \end{bmatrix}$

13. The pairs of numbers shown below show a linear pattern.

Number of Term	1	2	3	4	5	n
Term	2	7	12	17	22	...

Which of these could represent the n th term of the pattern?

A $2n + 5$

B $n - 6$

C $5n - 3$

D $5n + 2$

14. The domain and the range of g , a function, are shown in the table below.

x	$g(x)$
0	-3
1	1
2	5
3	9

Which of these defines function g ?

- A $g(x) = 3x - 4$
 - B $g(x) = 3x + 4$
 - C $g(x) = 4x + 3$
 - D $g(x) = 4x - 3$
-

15. Which of these is a factor of the polynomial below?

$$9m^2 - 12m + 4$$

- A $3m - 2$
 - B $3m + 2$
 - C $3m - 1$
 - D $3m - 4$
-

16. The ages of the six members of a cycling club are 17, 13, 16, 13, 17, and 14. What is the mean of these six ages?

- A 14
 - B 15
 - C 16
 - D 18
-

17. Which of these is equivalent to the following expression?

$$(a^2bc^4)(a^3bcd)(b^2d^5)$$

A $a^5b^5c^6d^6$

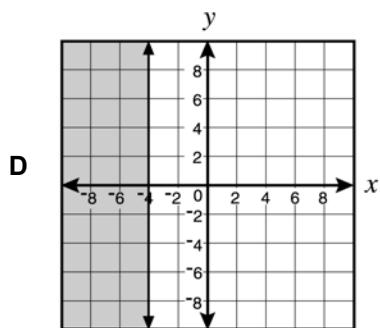
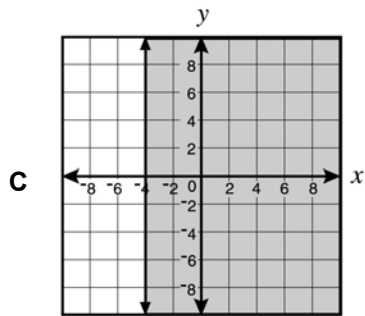
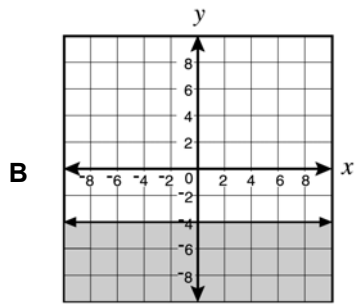
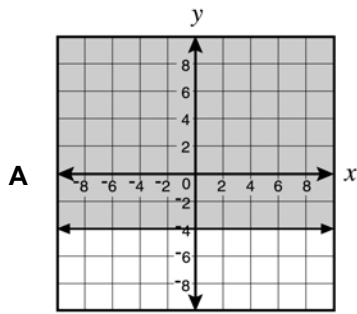
B $a^4b^5c^5d^7$

C $a^5b^4c^5d^6$

D $a^4b^4c^6d^6$

18. Which of the following BEST represents the graph of the equation shown below?

$$y \geq -4$$



19. Which shows the polynomial $8x^2 + 16x + 8$ completely factored?

A $(4x + 4)^2$

B $(4x + 4)(2x + 2)$

C $8(x + 1)^2$

D $8(x + 1)(x - 1)$

20. What are the coordinates for the intersection of the two lines below?

$$y = 2x + 4$$

$$y = \frac{1}{2}x - 2$$

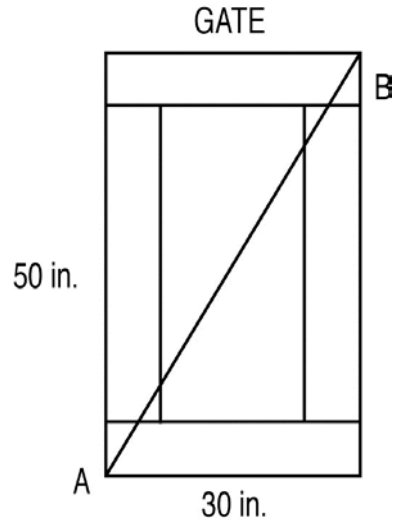
A $(4, 4)$

B $(-4, 4)$

C $(4, -4)$

D $(-4, -4)$

21. A 30-inch by 50-inch rectangular gate is strengthened by a diagonal wire \overline{AB} , which connects two opposite corners of the gate as indicated in the figure below.

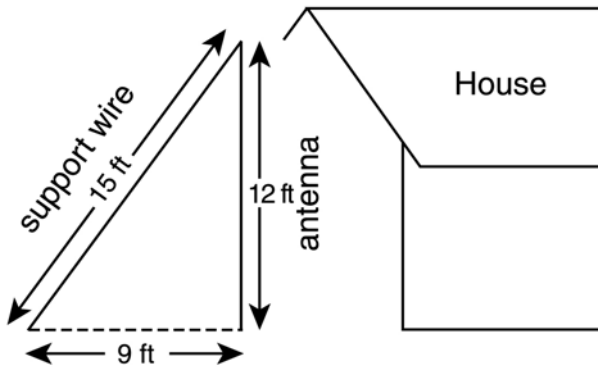


Which is closest to the length of \overline{AB} ?

- A 40 in.
B 58 in.
C 68 in.
D 80 in.
-
22. What is the equation of the line that contains the point (4, 5) and is parallel to $y = -\frac{2}{3}x + \frac{7}{3}$?

- A $y = \frac{3}{2}x - \frac{23}{3}$
B $y = -\frac{3}{2}x + \frac{23}{3}$
C $y = -\frac{2}{3}x + \frac{23}{3}$
D $y = \frac{2}{3}x - \frac{23}{3}$
-

23. Ted bought an antenna that is 12 feet high. He placed the antenna next to his house and attached a support wire as shown.

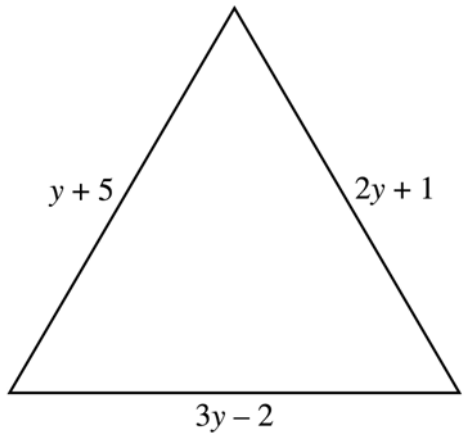


What is the slope of the support wire?

- A $\frac{3}{4}$
- B $\frac{4}{5}$
- C $\frac{4}{3}$
- D $\frac{5}{3}$
-
24. Chris has six sweaters, five pairs of jeans, and four pairs of shoes in his closet. How many different arrangements of three-piece outfits can Chris make of one sweater, one pair of jeans, and one pair of shoes?

- A 24
- B 30
- C 120
- D 240
-

25. Which of the following could be used to determine P , the perimeter of the triangle shown below?



- A $P = 6y + 4$
B $P = 5y - 4$
C $P = 6y - 4$
D $P = 5y + 4$
-
26. What is the solution to the system of equations shown below?

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

$$y = \frac{1}{2}x - 1$$

- A $(1, \frac{3}{2})$
B $(-2, 0)$
C There is no solution.
D There are infinite solutions.
-

27. Which of the following is equivalent to the equation shown below?

$$4(x + 2) = 2(x + 1)$$

- A $4x + 8 = 2x + 2$
 - B $4x + 2 = 2x + 1$
 - C $4x + 2 = 2x$
 - D $4x + 8 = 2x$
-

28. The table shows the relationship between x , the age of a girl and y , her average weight.

Age (x)	Weight in pounds (y)
3	35
10	70

If the relationship between the age and the average weight of a girl is linear, which of these could represent the data in the table?

- A $y = 5x + 20$
 - B $x = 5y + 20$
 - C $y = 7x + 35$
 - D $x = 7y + 35$
-

29. The Internal Revenue Service estimates that 52 million people will file their taxes on Tax Day. Which of these is 52 million expressed in scientific notation?

- A 5.2×10^{-7}
 - B 5.2×10^{-6}
 - C 5.2×10^6
 - D 5.2×10^7
-

30. Which of these is the linear equation $y = \frac{1}{2}x - 4$ expressed in STANDARD form?

- A $x - 2y = 8$
 - B $-\frac{1}{2}x + y = -4$
 - C $y + 4 = \frac{1}{2}x$
 - D $x + 2y = 8$
-

31. Kermit wants to hunt at a camp where it costs \$10 per day for those who purchase the membership card shown below.

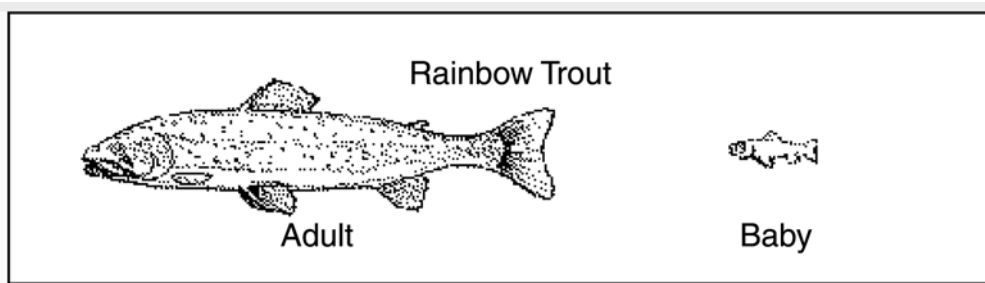


Without the membership card, it will cost \$15 per day for Kermit to hunt at the camp. Which of the following is the minimum number of days Kermit would need to hunt to save money by purchasing the card?

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

32. Karen rented a car for the weekend in order to take her grandmother to visit relatives. The charge was a fixed rate of \$10.00 plus \$0.30 per mile. If Karen wants to spend no more than \$100.00 to rent the car, what is the GREATEST number of miles she can drive?
- A 3 miles
 - B 10 miles
 - C 30 miles
 - D 300 miles
-

33. An adult rainbow trout is about 12 times as large as a baby rainbow trout.

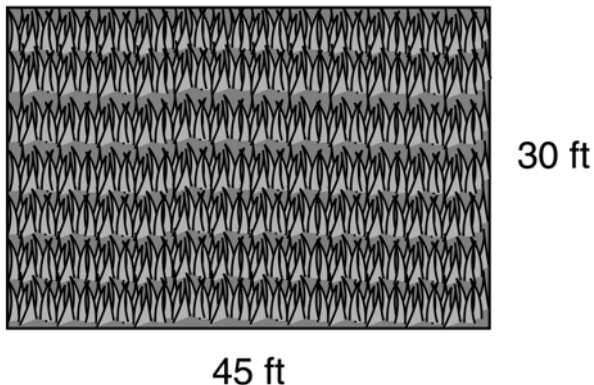


If an adult trout is 40 centimeters in length, which is closest to the length of a baby trout?

- A 3.3 centimeters
 - B 12.1 centimeters
 - C 40.0 centimeters
 - D 48.0 centimeters
-
34. What is the value of the expression $(3x - 11)^2$ when $x = 8$?
- A 26
 - B 169
 - C 256
 - D 1225
-

35. Damon wants to fertilize his lawn for the spring season. The dimensions of his lawn are shown below.

Damon's lawn



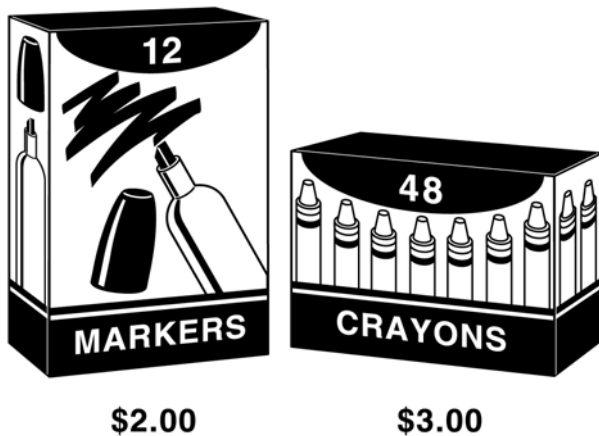
Johnson's Garden Shop sells fertilizer in 6-pound bags that cover an area of 500 square feet. How many bags of fertilizer will Damon need to completely fertilize his lawn?

- A 2
B 3
C 4
D 5
-
36. For a long-distance call, a telephone company charges \$0.75 for the first three minutes, and \$0.15 for each additional minute. If the telephone company plans to increase the charge for each additional minute by 5 cents, which of these will represent C , the total charge for t minutes?
- A $C = (0.75 + 0.05) + 0.15t$
B $C = (0.15 + 0.05) + 0.75t$
C $C = 0.15 + (0.05 + 0.75)t$
D $C = 0.75 + (0.05 + 0.15)t$
-

37. Line l passes through point $(0, -1)$ and is parallel to the line whose equation is $y = -2x + 7$. Which equation best describes the graph of line l ?

- A $y = -2x + 6$
 - B $y = 2x + 6$
 - C $y = \frac{1}{2}x - 1$
 - D $y = -2x - 1$
-

38. Mrs. Allan is going to buy markers and crayons for the 17 students in her kindergarten class. She has \$44 to spend for the markers and crayons. Markers cost \$2 for each box and crayons cost \$3 for each box.



If Mrs. Allan decides to buy seven boxes of markers, what is the **GREATEST** number of boxes of crayons she can buy, not including tax?

- A 9 packages of crayons
 - B 10 packages of crayons
 - C 12 packages of crayons
 - D 30 packages of crayons
-

39. A container has six cubes. Of these cubes, two are red, one is green, and three are black. If two cubes are drawn from the container at the same time, what is the probability that both cubes will be black?

A $\frac{1}{5}$

B $\frac{1}{2}$

C $\frac{3}{5}$

D $\frac{1}{4}$

40. A publishing company charges a fixed rate of \$25.00 per order plus \$0.50 per pound to deliver books to a customer. Which could be used to determine c , the total charge, for delivering p , pounds of books, to a customer?

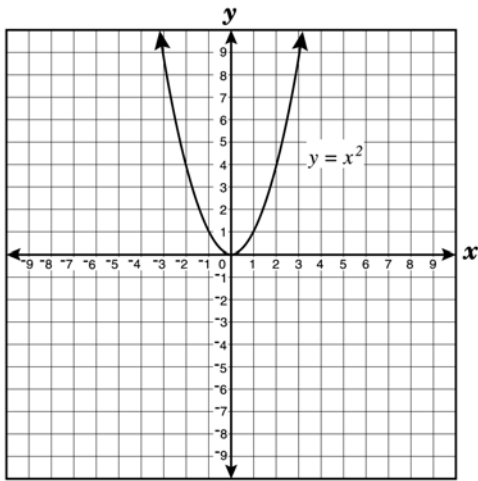
A $c = 25.00p + 0.50$

B $c = 25.00 + 0.50p$

C $c = 25.00p(0.50)$

D $c = \frac{25.00p}{0.50}$

41. The following is the graph of the equation $y = x^2$, in which y is a function of x .



Which of these describes the *range* of the function?

- A x is all real numbers
 - B y is all real numbers
 - C $y \geq 0$
 - D $x \geq 0$
-

42. Line segment AB has a midpoint at $\left(\frac{11}{2}, \frac{7}{2}\right)$ on the coordinate plane. If point A is located at $(8, 2)$, which of these ordered pairs represents the location of point B ?

- A $\left(\frac{27}{4}, -\frac{11}{4}\right)$
 - B $(3, 5)$
 - C $(5, 3)$
 - D $(4, 1)$
-

43. A human heart beats approximately 72 times each minute. Which of these is closest to the number of times the human heart beats in one day?

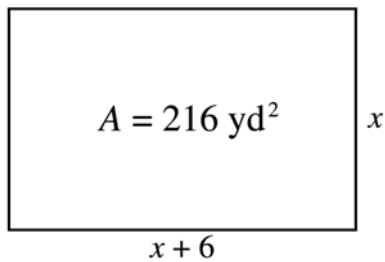
A 1×10^5 beats per day

B 1×10^6 beats per day

C 2×10^5 beats per day

D 2×10^6 beats per day

44. The length of the rectangle below is 6 yards longer than the width.



If the area of the rectangle is 216 square yards, what are the dimensions of the rectangle in yards?

A 6 by 12

B 20 by 12

C 18 by 12

D 19 by 12

45. Amy is taking a mathematics course this year. She has taken four tests and has one more to complete the course. Her scores are 85, 94, 89, and 97. In order to earn an A in the course, she must end up with at least a 90 average. Which of the following can Amy use to determine the score she must make on the fifth test to earn an A?

A $\frac{85 + 94 + 89 + 97 + x}{5} \geq 90$

B $5(85 + 94 + 89 + 97 + x) \geq 90$

C $\frac{5(85 + 94 + 89 + 97)}{x} \geq 90$

D $\frac{x(85 + 94 + 89 + 97)}{5} \geq 90$

46. At Gulfport Electronics, Randy earns a monthly salary of \$1500 plus a 5% commission of t , his total monthly sales. If his March earnings total \$2500, which of these equations could be used to determine his total monthly sales for March?

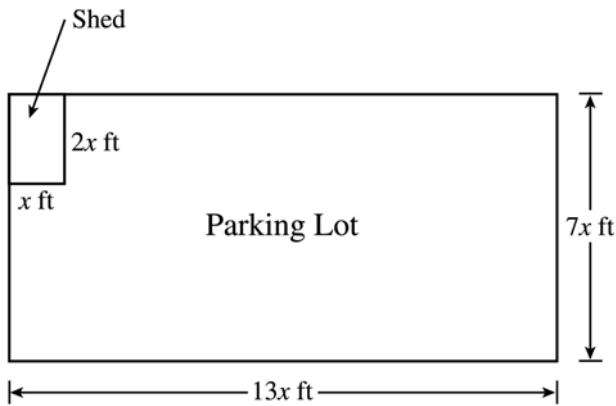
A $0.05t = 2500$

B $0.05t = 4000$

C $t + 1500 = 0.05(2500)$

D $1500 + 0.05t = 2500$

47. An area with the dimensions shown below is being reserved for a utility shed at the northwest location of a parking lot.



Which of the following expressions could represent, in square feet, the area of the lot NOT reserved for the shed?

- A $23x$
 - B $91x$
 - C $89x^2$
 - D $91x^2$
-
48. Mitchell works in a bakery and makes cookies. He wants to use a recipe for butterscotch cookies that requires three teaspoons of salt to make ten dozen cookies. Which of these could Mitchell use to determine x , the teaspoons of salt required for thirty dozen cookies?

- A $\frac{3}{10} = \frac{x}{30}$
 - B $\frac{10}{3} = \frac{x}{30}$
 - C $\frac{3}{30} = \frac{x}{10}$
 - D $\frac{10}{30} = \frac{x}{3}$
-

49. If the line segment connecting the points $(5, 7)$ and $(13, 1)$ is sketched on a coordinate plane, what is the length of the segment in units?

A $\sqrt{10}$

B $\sqrt{14}$

C 10

D 14

50. Which is an equation for the line that passes through $A(3, -9)$ and $B(2, 4)$?

A $y = \frac{1}{13}x + \frac{30}{13}$

B $y = -\frac{1}{13}x + \frac{30}{13}$

C $y = 13x - 30$

D $y = -13x + 30$

51. A certain rectangle has its vertices at $P(1, 0)$, $Q(1, 3)$, $R(4, 3)$, and $S(4, 0)$ in the coordinate plane. Which is the equation of the line containing the segment PR ?

A $y = -x + 1$

B $y = -x - 1$

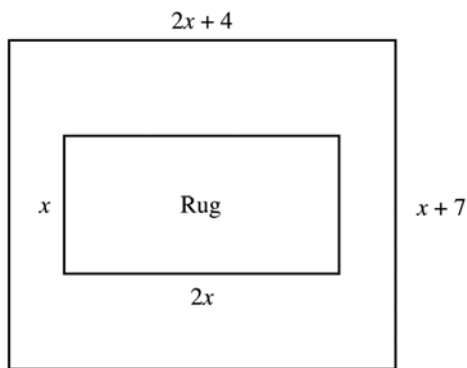
C $y = x + 1$

D $y = x - 1$

52. Richard was asked to go to the blackboard during algebra class and circle a polynomial of degree 2. Which of these is a polynomial of degree 2?

- A $2x + 1$
 - B $2x^2 + 1$
 - C $4x^3 + 2x^2$
 - D $4x^4 + 2x^3$
-

53. The floor of Dwylene's bedroom is shaped like a rectangle. She has a rectangular-shaped rug in the center of the floor with the dimensions shown.

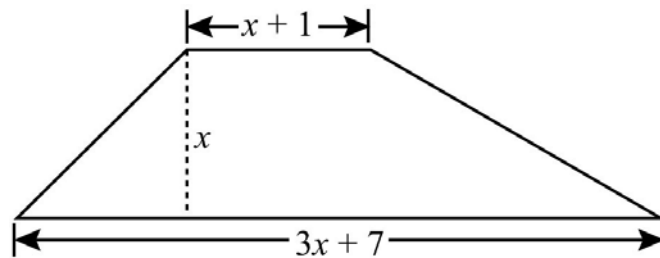


What is the area, in square feet, of the bedroom floor NOT covered by the rug?

- A 22
 - B $2x^2$
 - C $2x^2 + 18x + 28$
 - D $18x + 28$
-
54. Paula makes purses. The materials cost \$2.25 per purse. She sells them for \$5.00 each. Paula wants to invest \$5000 for some new equipment. Which of these could be used to determine x , the number of purses Paula must sell to pay for the new equipment?

- A $5.00x - 2.25x = 5000$
 - B $5.00x + 2.25x = 5000$
 - C $5.00x = 5000$
 - D $2.25x = 5000$
-

55.



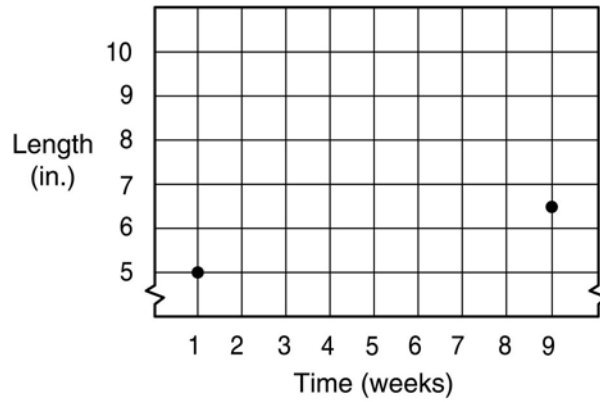
Which expression describes the area, in square units, of the trapezoid shown above?

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

56. The standard form of a linear equation is $Ax + By = C$. Which of these is the same linear equation rewritten in slope-intercept form?

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

57. Joel made a graph for a science project to show the growth of his pet turtle over a period of 9 weeks. At the end of week 1 his turtle was 5 inches long. The final measurement after week 9 was $6\frac{1}{2}$ inches long.



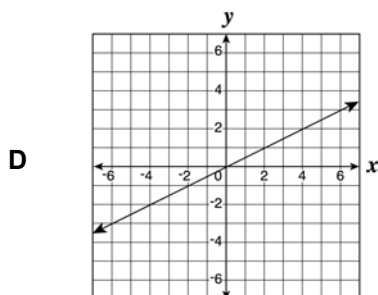
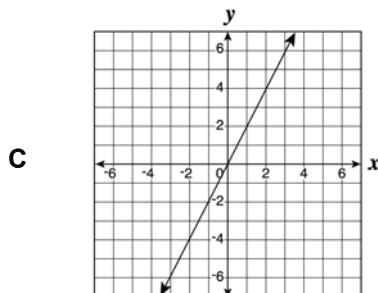
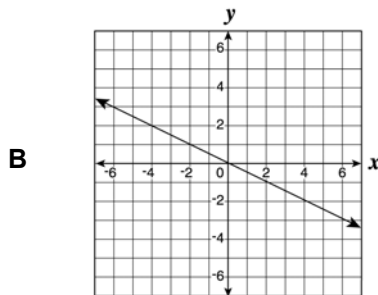
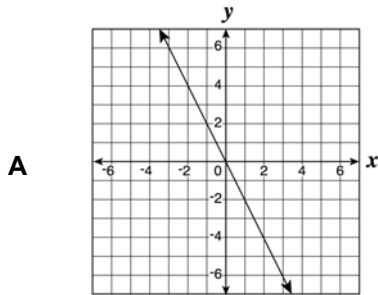
What was the turtle's average growth rate in inches per week?

- A $\frac{1}{8}$
- B $\frac{2}{9}$
- C $\frac{3}{16}$
- D $\frac{1}{6}$

58. The table below shows the coordinates for five points on line l .

x	y
-4	8
-2	4
0	0
2	-4
4	-8

Which of these could represent line l ?



59. On the standard coordinate plane, what is the distance between the points (8, 4) and (3, 2)?

- A 29
 - B $\sqrt{29}$
 - C $\sqrt{7}$
 - D 7
-

60. Which of these is equivalent to the expression below when $a = 2$, $b = -13$, and $c = 15$?

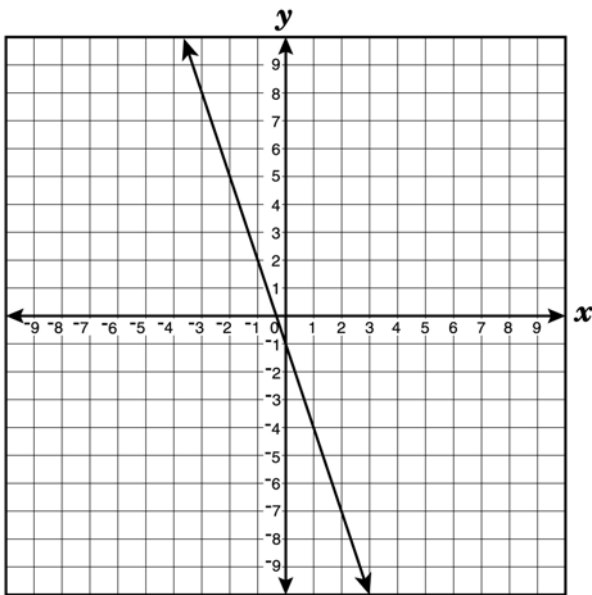
$$-b - \sqrt{b^2 - 4ac}$$

- A 0
 - B 6
 - C 20
 - D 26
-

61. What is the range of the function $f(x) = x^2 - 6$ when the domain is {3, 4, 5}?

- A {3, 4, 5}
 - B {-3, -2, -1}
 - C {3, 10, 19}
 - D {0, 2, 4}
-

62. The graph of $y = -3x - 1$ is shown below.



Which of the following equations represents the line perpendicular to $y = -3x - 1$ and passing through the point $(4, 3)$?

- A $y = -3x + 15$
- B $y = \frac{1}{3}x - \frac{5}{3}$
- C $y = 3x - 9$
- D $y = \frac{1}{3}x + \frac{5}{3}$
-
63. Which shows the following polynomial factored completely?

$$9s^3 + 24s^2 + 16s$$

- A $s(3s - 4)^2$
- B $3s(3s^2 + 8s)$
- C $3s^2(3s + 8)$
- D $s(3s + 4)^2$

- 64.** The table below shows the relationship between x and y .

x	-2	-1	0	1	2	3
y	-1	1	3	5	7	9

- In your response booklet, graph the information from the table on a coordinate plane. Draw a line through the points. Be sure to label your axes and use an appropriate scale.
- Write an equation that could represent the line in your graph.
- Use your equation to find the y -coordinate of a point on the line when the x -coordinate is 15. Show your work.

- 65. Mrs. Reynolds wanted to plant about 10 new shrubs along the front of her property. A local nursery had two sizes of shrubs, small ones that sell for \$3.50, and large ones for \$5.00 each.**
- a. Mrs. Reynolds decided that she wanted to buy her shrubs from the nursery but spend no more than \$40.00 total. Write an inequality that Mrs. Reynolds could use to help determine the number of x , small shrubs, and y , large shrubs that she could buy without spending more than \$40.00.**
 - b. List the number of small and large shrubs Mrs. Reynolds could buy so that she would have exactly 10 shrubs without spending more than \$40.00. Show or explain how you found your answer.**
 - c. Explain which combinations of small and large shrubs Mrs. Reynolds should buy to have the GREATEST number of large shrubs.**