



Arkansas Comprehensive Testing, Assessment, and Accountability Program

Released Item Booklet

Algebra I End-of-Course Examination

April 2010 Administration

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Arkansas Department of Education

PART II Released Algebra I Items

1. Frank Dewey, John Smith, and Bill Howe manage three different used-car lots. The inventory of each brand of truck, van, and car is shown in the matrices below.

	Dewey				Smith				Howe		
	Trucks	Vans	Cars		Trucks	Vans	Cars		Trucks	Vans	Cars
Brand A	10	12	14	Brand A	6	7	10	Brand A	6	12	14
Brand B	5	10	15	Brand B	10	12	14	Brand B	12	12	12
Brand C	3	6	9	Brand C	6	5	4	Brand C	10	8	6

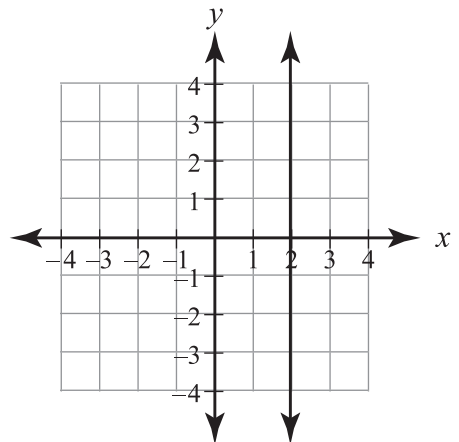
Which matrix would represent their total inventory if they combined their businesses?

- *A. $\begin{bmatrix} 22 & 31 & 38 \\ 27 & 34 & 41 \\ 19 & 19 & 19 \end{bmatrix}$ B. $\begin{bmatrix} 22 & 27 & 19 \\ 31 & 34 & 19 \\ 38 & 41 & 19 \end{bmatrix}$
- C. $\begin{bmatrix} 10 & 12 & 14 \\ 5 & 10 & 15 \\ 3 & 6 & 9 \end{bmatrix}$ D. $\begin{bmatrix} 16 & 19 & 24 \\ 15 & 22 & 29 \\ 9 & 11 & 13 \end{bmatrix}$

2. What is the relationship between the lines having the equations $y = 4x + 2$ and $y = -\frac{1}{4}x$?

- A. They are parallel lines.
 B. They are the same line.
 *C. They are perpendicular lines.
 D. They are neither parallel nor perpendicular.

3. What is the slope of the line graphed below?



- A. 0
 B. $\frac{0}{2}$
 C. 2
 *D. undefined

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4. A physics class launches a rocket straight into the air. The path of the rocket can be represented in the equation below where y is the rocket's height, in feet, above the ground, and t is the time, in seconds, after the rocket is launched.

$$y = -16t^2 + 64t + 1$$

What is the height of the rocket after 2 seconds?

- A. 49 feet
 *B. 65 feet
 C. 97 feet
 D. 193 feet
5. Assuming no denominator equals 0, which shows the expression $\frac{40x^3}{46x^2y}$ completely simplified?

- A. $\frac{7x}{8y}$
 *B. $\frac{20x}{23y}$
 C. $\frac{20x^3}{23x^2y}$
 D. $\frac{40x}{46y}$

6. Let $f(x) = 3x^2 + 6x - 9$ and $g(x) = x^2 + 5x + 6$. Which expression represents $f(x) + g(x)$?

- A. $2x^2 + x - 3$
 *B. $4x^2 + 11x - 3$
 C. $4x^2 + 11x - 15$
 D. $3x^4 + 11x^2 - 15$

7. What are the solutions to $x^2 - 7x + 12 = 0$?

- A. $x = -7$ and 12
 B. $x = -4$ and -3
 C. $x = 2$ and 6
 *D. $x = 3$ and 4

8. Which function table does **not** show a linear relationship between x and y ?

A.

x	10	20	30	40	50
y	10	20	30	40	50

B.

x	10	20	30	40	50
y	20	30	40	50	60

*C.

x	10	20	30	40	50
y	10	30	70	130	210

D.

x	10	20	30	40	50
y	1	2	3	4	5

9. If $f(x) = 3x - \frac{1}{2}$, what is the value of $f(-3)$?

- *A. $-9\frac{1}{2}$
 B. $2\frac{1}{2}$
 C. $8\frac{1}{2}$
 D. $9\frac{1}{2}$

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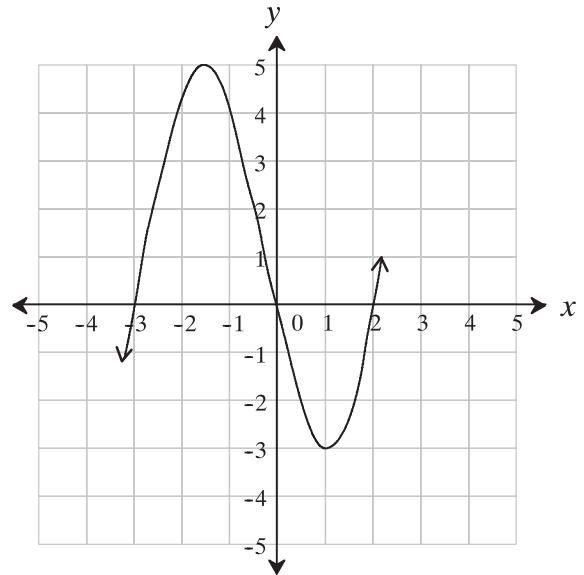
10. Alisha counts the cars in the parking lot in front of her mother's store. The table below shows how many of each color Alisha sees.

Color	Number of Cars
red	2
blue	5
yellow	1
green	4
black	5

Alisha hears a car driving away. Assuming that each car is equally likely to leave the parking lot at any given time, what is the probability that the car is green?

- A. $\frac{1}{17}$
- B. $\frac{1}{5}$
- *C. $\frac{4}{17}$
- D. $\frac{4}{13}$
11. Cherie likes to go rock climbing. One day, she starts at an altitude of 286 feet and begins climbing at a rate of 7 feet per minute. She then stops her climb at an altitude of 503 feet. Which equation could be solved to find the number of minutes, x , that Cherie spent climbing?
- A. $503 + 7x = 286$
- B. $286 - 7x = 503$
- C. $286x + 7 = 503$
- *D. $286 + 7x = 503$

Use the graph below to answer question 12.



12. What are the zero(s) of the function above?
- A. $(3, 0), (0, 0), (-2, 0)$
- B. $(-1.5, 5), (1, -3)$ only
- C. $(-3, 0), (2, 0)$ only
- *D. $(-3, 0), (0, 0), (2, 0)$
13. Water is 2 parts hydrogen to 1 part oxygen. How many parts of oxygen must unite with 6 parts hydrogen to form water?
- A. $\frac{1}{12}$
- B. $\frac{1}{3}$
- *C. 3
- D. 12

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14. Kyle orders several new CDs. Each CD costs \$2.00, and an additional \$3.99 is added to the total cost of the order for shipping. Which equation represents the relationship between y , the total cost of the order, and x , the number of CDs ordered?

- A. $y = 2x$
- B. $y = 3.99x$
- C. $y = 2 + 3.99$
- *D. $y = 2x + 3.99$

15. Which is equivalent to the expression below?

$$\frac{9x^8y^3z^4}{3x^3y^4z^2}$$

- *A. $\frac{3x^5z^2}{y}$
- B. $\frac{3x^{11}z^6}{y^7}$
- C. $\frac{6x^5z^2}{y}$
- D. $\frac{6x^{11}z^6}{y^7}$

16. A function is defined by the table below.

x	y
1	2
3	4
8	5

What is the domain of the function?

- A. $1 \leq x \leq 3$
- *B. $\{1, 3, 8\}$
- C. $\{2, 4, 5\}$
- D. $\{1, 2, 3, 4, 5, 8\}$

17. Which is a completely factored form of the expression $3x^2 - 75$?

- *A. $3(x + 5)(x - 5)$
- B. $3(x - 5)(x - 5)$
- C. $3(x + 5)(x + 5)$
- D. $(3x + 5)(x - 5)$

18. Fred's TV is not working, and he is thinking of buying a new TV for \$165. On the way to the store, he sees the sign below in the window of David's Electronics Repair Shop.

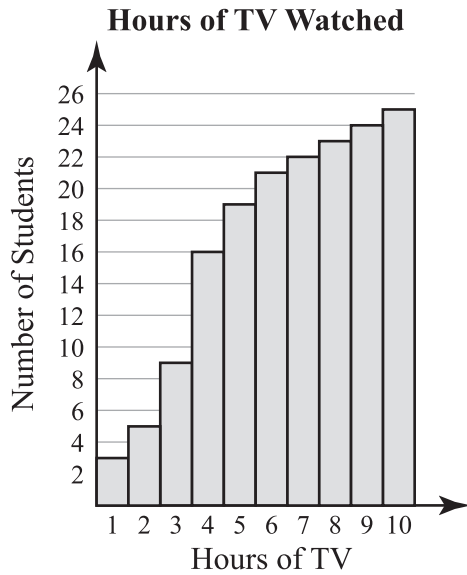
We Service All Brands
\$40 per service call
plus \$25 per hour.

Using x for the number of hours of work, which equation represents when the repair bill for Fred's TV would equal the cost of the new TV?

- A. $25 + 40x = 165$
- B. $40 + 5x = 165$
- *C. $40 + 25x = 165$
- D. $65x = 165$

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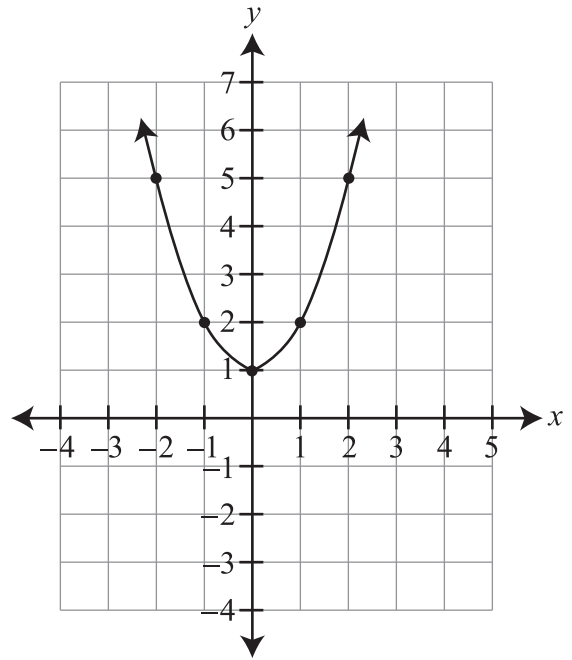
19. Sheryl created a cumulative histogram to show data about the hours of television watched per day by students in her class.



How many students watched no more than 4 hours of television per day?

- A. 2
- B. 7
- *C. 16
- D. 33

20. The function with equation $y = x^2 + 1$ is graphed below.



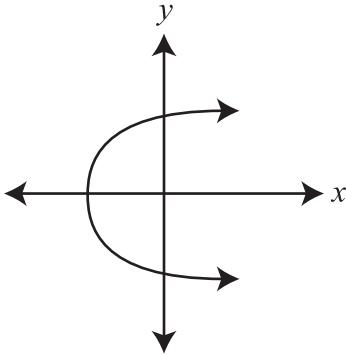
What are the coordinates of the vertex of the graph?

- A. (0, 0)
- *B. (0, 1)
- C. (1, 2)
- D. (-1, 2)

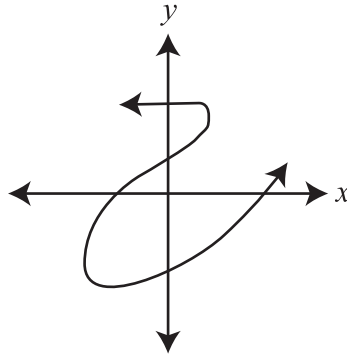
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21. Which graph represents a function of y in terms of x ?

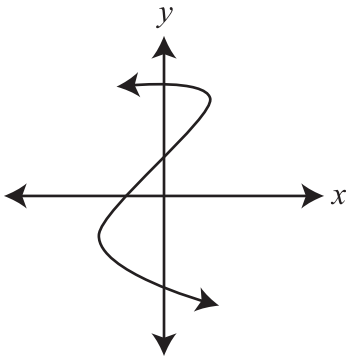
A.



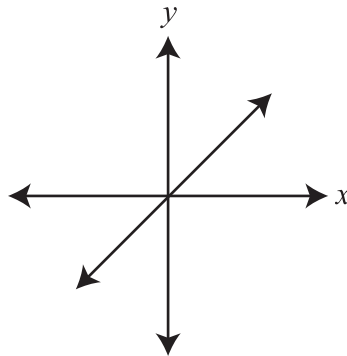
B.



C.



*D.



22. A minute is about 0.0000992 weeks. How is this number written in scientific notation?

- *A. 9.92×10^{-5}
- B. 0.992×10^{-4}
- C. 0.992×10^5
- D. 9.92×10^5

23. Todd works as a waiter and records the tips he receives from each customer. The first 8 customers give him the tips below.

\$1.00	\$1.00	\$1.50	\$2.00
\$2.50	\$3.00	\$4.00	\$5.00

The next customer gives Todd a \$7.00 tip. How does that change the mean of the tips?

- A. It stays the same.
- B. It increases by \$0.25.
- *C. It increases by \$0.50.
- D. It increases by \$7.00.

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24. What is the solution to the equation below?

$$\frac{2}{3}x + 7 = 15$$

- A. $x = 5.3$
- *B. $x = 12.0$
- C. $x = 14.6$
- D. $x = 33.0$

25. Which is equivalent to the expression

$$6\sqrt{7} + \sqrt{6} - 3\sqrt{7}?$$

- A. 3
- B. $3 + \sqrt{6}$
- C. $6\sqrt{7} - 3$
- *D. $3\sqrt{7} + \sqrt{6}$

26. Below are three flavors of ice cream and the different amounts of three sugars used in making each flavor.

- Flavor A has 3 parts Sugar L, 5 parts Sugar M, and 2 parts Sugar N.
- Flavor B has 6 parts Sugar L, 1 part Sugar M, and 3 parts Sugar N.
- Flavor C has 5 parts Sugar L, 4 parts Sugar M, and 7 parts Sugar N.

Which matrix shows how much of each sugar was used in making each flavor?

*A.

	L	M	N
A	3	5	2
B	6	1	3
C	5	4	7

B.

	L	M	N
A	3	6	5
B	5	1	4
C	2	3	7

C.

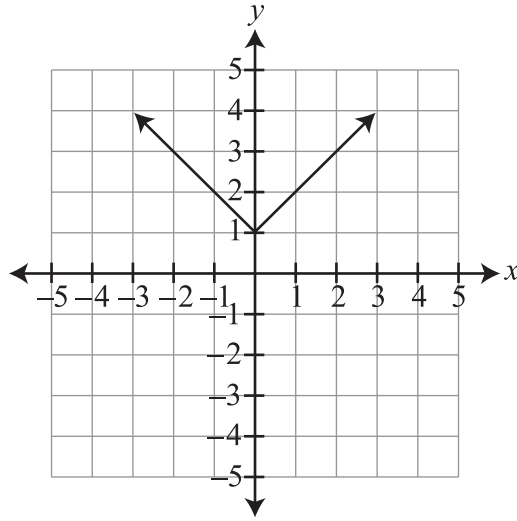
	L	M	N
A	6	1	3
B	5	4	7
C	3	5	2

D.

	L	M	N
A	5	4	7
B	6	1	3
C	3	5	2

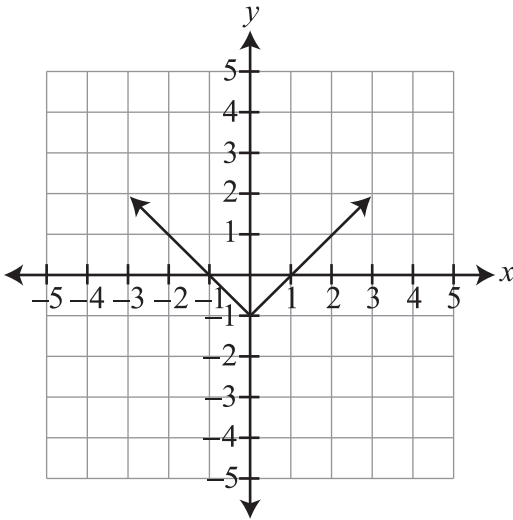
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27. The graph of a function is shown below.

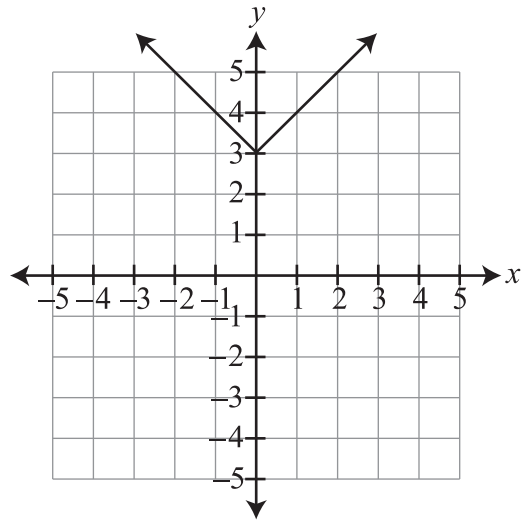


Which is the image of the graph after a vertical shift of -2 ?

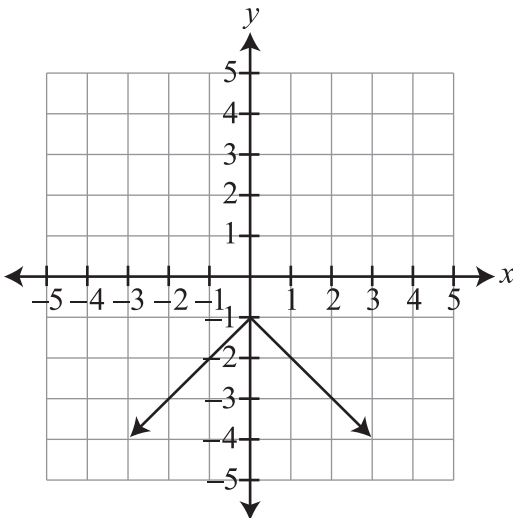
*A.



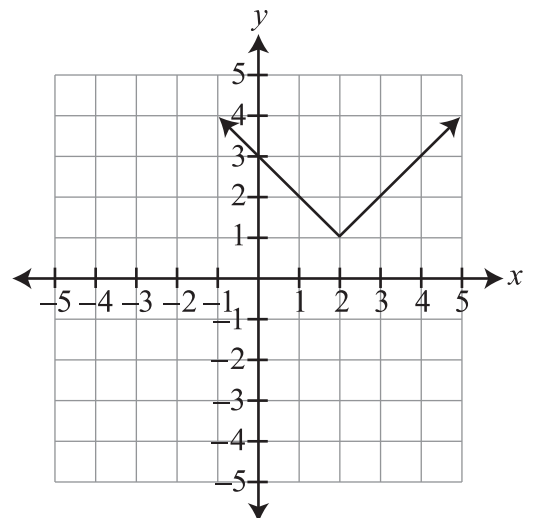
B.



C.

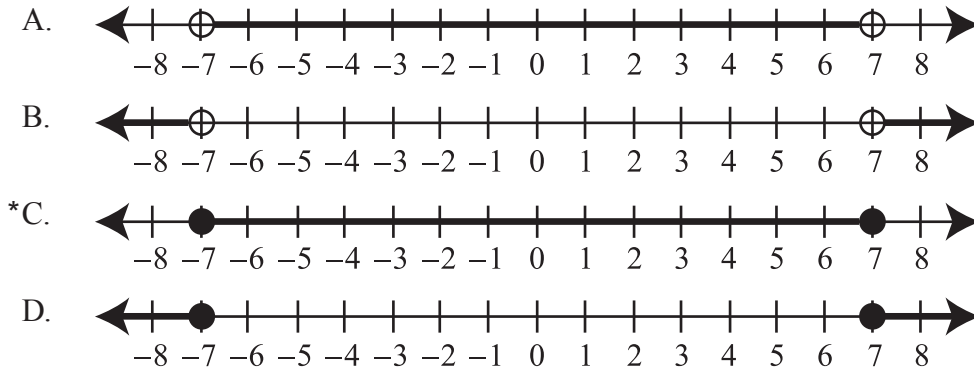


D.



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28. Which graph represents the solution set to $|x| \leq 7$?



29. Holly ordered rolls of film from a catalogue. Each roll of film costs \$4, and there is a \$7 charge for shipping. Which equation describes Holly's cost, C , for n rolls of film?

- A. $C = 7n + 4$
- *B. $C = 4n + 7$
- C. $n = 4C + 7$
- D. $n = 7C + 4$

30. The amount of money Abe earns varies directly with the number of hours he works. He earned \$262.50 for the first 21 hours he worked. If he worked an additional 12 hours, what would be his total earnings?

- A. \$112.50
- B. \$150.00
- *C. \$412.50
- D. \$721.88

31. The formula for simple interest plus starting principal, where A = amount, P = principal, r = interest rate per period, and t = time, is given below.

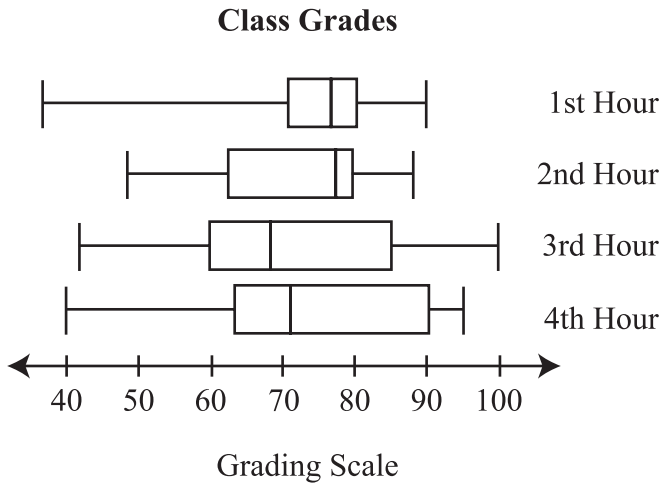
$$A = P + Prt$$

Which could be used to find the time, t , if the amount, principal, and interest are known?

- A. $A - P - Pr = t$
- *B. $\frac{A - P}{Pr} = t$
- C. $\frac{A - Pr}{P} = t$
- D. $\frac{A}{P + rt} = t$

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32. Mr. Philbrook recently gave a test to all four of his Algebra I classes. The box-and-whisker plot below shows the results.



Which class had the highest 3rd quartile?

- A. 1st Hour
- B. 2nd Hour
- C. 3rd Hour
- *D. 4th Hour

33. Mallory often babysits her neighbors' children. She gets paid \$6.00 per hour for one child and another dollar per hour for each additional child, as shown in the table below.

Number of Children	Hourly Rate (\$)
1	6
2	7
3	8
4	9

What is the domain and range for the data?

- *A. Domain: {1, 2, 3, 4}; Range: {6, 7, 8, 9}
- B. Domain: {6, 7, 8, 9}; Range: {1, 2, 3, 4}
- C. Domain: {Number of Children}; Range: {Number of Hours}
- D. Domain: {Number of Hours}; Range: {Number of Children}