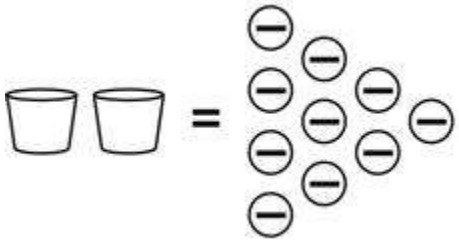
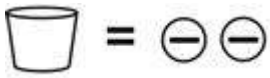
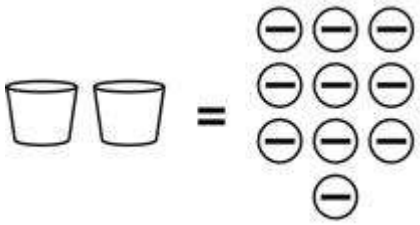
Directions: Answer the following question(s).

1 **The equation $2x = -10$ is modeled below.**

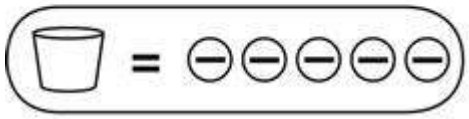


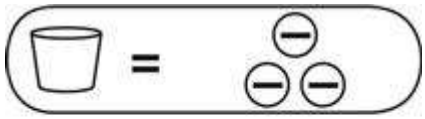
Which model shows a correct next step to solve this equation?

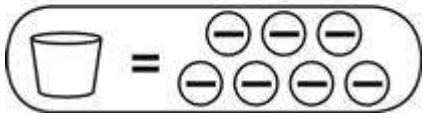
A. 

B. 

C. 



D. 



Directions: Answer the following question(s).

Master ID: 142468 Revision: 1
Correct: C
Rationale:
A. This is an incorrect final solution step - modeling $x = -2$
B. Nothing occurred here except for rearrangement of the discs
C. **Correct**
D. Each cup does not contain an even amount of discs
Standards:
CCSS.MA.9-12.A-REI.1

2 **Leila was asked to solve the equation $\frac{2}{3}(x+5)=29$. The first step she did to solve the equation was $\frac{2}{3}(x)+\frac{2}{3}(5)=29$. What property did she use in this step?**

A. associative
B. commutative
C. distributive
D. reflexive

Master ID: 141327 Revision: 1
Correct: C
Rationale:
A. Student does not understand the associative property
B. Student does not understand the commutative property
C. **Correct**
D. Student does not understand reflexive property
Standards:
CCSS.MA.9-12.A-REI.1

Directions: Answer the following question(s).

3 **TEACHER READS:**

Read the question to yourself and select the best answer.

What is the solution to the following equation?

$2(x + 8) = 36$

A. $x = 26$
B. $x = 14$
C. $x = 13$
D. $x = 10$

Master ID: 412805 Revision: 1
Correct: D
Rationale:
A. Student(s) may have distributed multiplication over addition correctly, but may have made an error in adding 16 to the right side while subtracting it on the left.
B. Student(s) may not have distributed multiplication over addition correctly, having multiplied 2 times *x*, but not times 8.
C. Student(s) may not have distributed multiplication over addition correctly, having multiplied 2 times *x*, but added 2 plus 8 instead of multiplying 2 times 8.
D. Correct answer
Standards:
CCSS.MA.9-12.A-REI.3

4 **If *x* is an integer, what is the minimum value of *x* that satisfies the inequality below?**

$$6x - 3(2x - 1) > 7 - 4(x + 2)$$

A. 1
B. 0
C. -1
D. -2

Master ID: 149515 Revision: 1
Correct: B
Rationale:
A. 1 is greater than -1, did not believe 0 is an integer
B. **Correct**
C. Chose the endpoint of the open interval
D. Treated -2 as greater than -1
Standards:
CCSS.MA.9-12.A-REI.3

Directions: Answer the following question(s).

5 **TEACHER READS:**

Read the question to yourself and select the best answer(s).

A furniture store has a modern–looking table and matching chairs for sale. The store has a total of 100 tables and 200 chairs in inventory to sell. The cost of two chairs and one table is $190.

An owner of a restaurant originally orders 40 chairs and 10 tables, from the furniture store, costing a total of $2900.

Which of the following orders will result in the same cost per chair and same cost per table as the original order from the restaurant, assuming that the cost of two chairs and one table is still $190? Select *all* that apply.

A. ordering 15 chairs and 5 tables costing a total of $1200
B. ordering 20 chairs and 10 tables costing a total of $1900
C. ordering 35 chairs and 5 tables costing a total of $2895
D. ordering 46 chairs and 13 tables costing a total of $3470
E. ordering 50 chairs and 15 tables costing a total of $3090

Master ID: 2035796 Revision: 1
Correct: ABD
Rationale:

A. Correct answer
B. Correct answer
C. Student(s) may have thought that when subtracting 5 from all of the terms in the equation, $40x + 10y = 2900$, an equivalent equation would have resulted.
D. Correct answer
E. Student(s) may not have multiplied all of the terms in the equation $2x + y = 190$ by 5 before adding it to the equation $40x + 10y = 2900$.

Standards:
CCSS.MA.9-12.A-REI.5

Directions: Answer the following question(s).

6 **What is the value of *x* in the solution to the system of equations below?**

$$2x + y = 1$$
$$2x + 3y = 11$$

A. $x = 5$
B. $x = 3$
C. $x = -1$
D. $x = -2$

Master ID: 154766 Revision: 1
Correct: D
Rationale:

A. Chose the value of *y*
B.
$$\begin{array}{r} 2x + y = 1 \\ -2x + 3y = 11 \\ \hline 4y = 12 \\ y = 3 \end{array}$$
C.
$$\begin{array}{r} 2x + y = 1 \\ -2x + 3y = 11 \\ \hline 4y = 12 \end{array}$$
$y = 3 \rightarrow 2x + 3 = 1 \rightarrow x = -1$
D. **Correct**

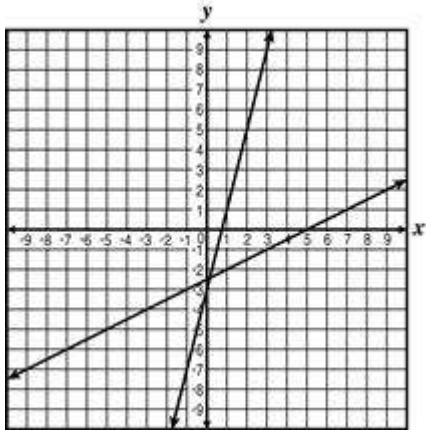
Standards:
CCSS.MA.9-12.A-REI.6

Directions: Answer the following question(s).

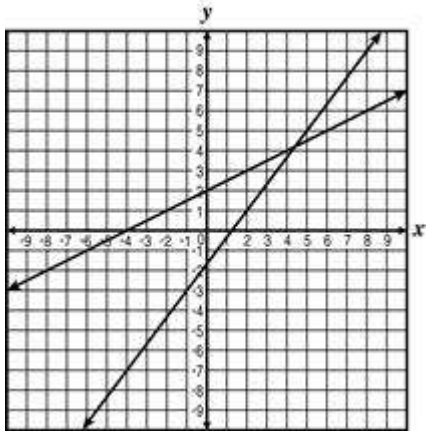
7 **Which graph BEST represents the solution to the system of equations below?**

$$\begin{cases} 4x - 8y = -20 \\ 4x - 3y = 5 \end{cases}$$

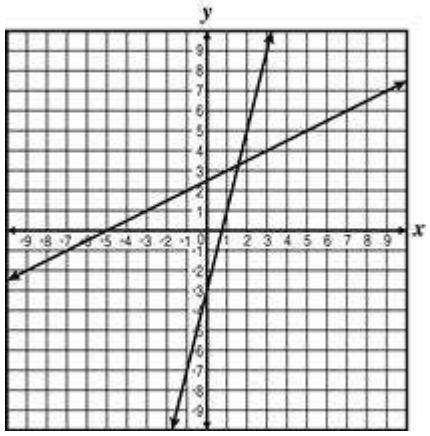
A.



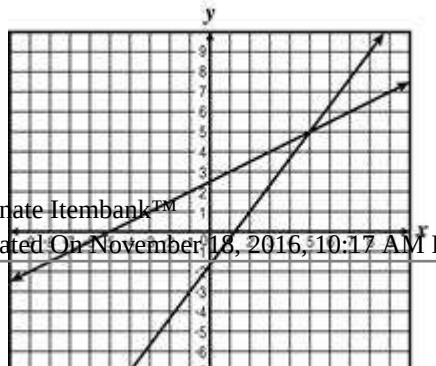
B.



C.



D.



Directions: Answer the following question(s).

Master ID: 154725 Revision: 1
Correct: D
Rationale:
A. Graphed $y = 4x - 3$ and $y = \frac{1}{2}x - \frac{5}{2}$
B. Graphed $y = \frac{4}{3}x - \frac{5}{3}$ and $y = \frac{1}{2}x + 2$
C. Graphed $y = 4x - 3$ and $y = \frac{1}{2}x + \frac{5}{2}$
D. **Correct**
Standards:
CCSS.MA.9-12.A-REI.6

8 **Which of the following points lies on the graph of the equation** $6x - 4y = 12$?

A. $(-4, -3)$
B. $(-4, 3)$
C. $(4, -3)$
D. $(4, 3)$

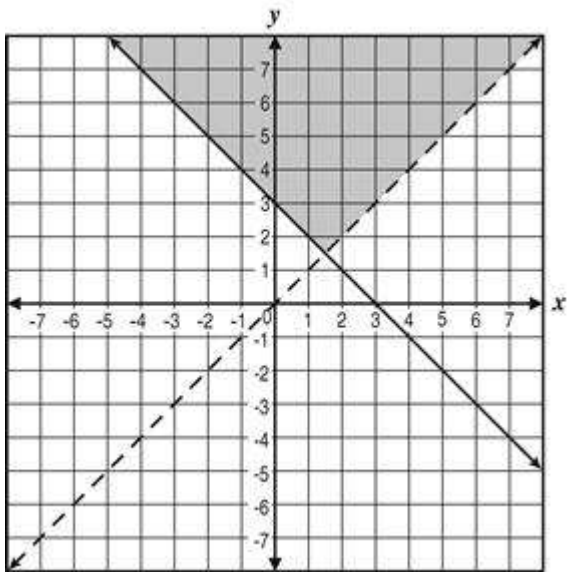
Master ID: 148855 Revision: 1
Correct: D
Rationale:
A. Disregarded negative sign of -12 when distributing $x = -4, y = -3$
B. Sign error when evaluating $6x$ or $6(-4)$
C. Sign error when evaluating $-4y$ or $-4(-3)$
D. **Correct**
Standards:
CCSS.MA.9-12.A-REI.10

Directions: Answer the following question(s).

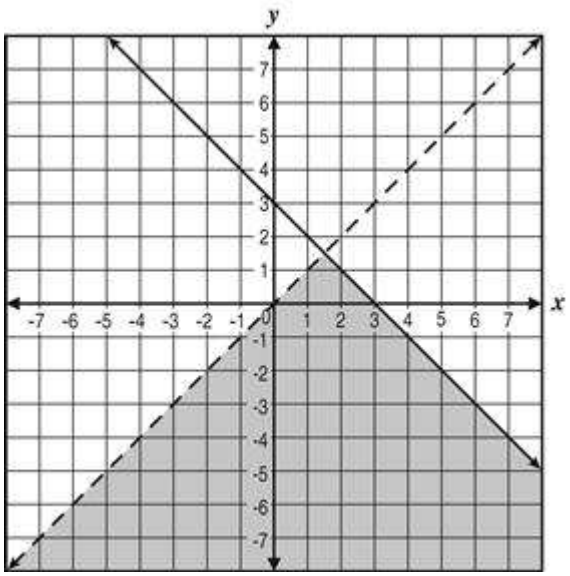
9 **Which graph represents the system of linear inequalities?**

$$\begin{cases} y < x \\ y \geq -x + 3 \end{cases}$$

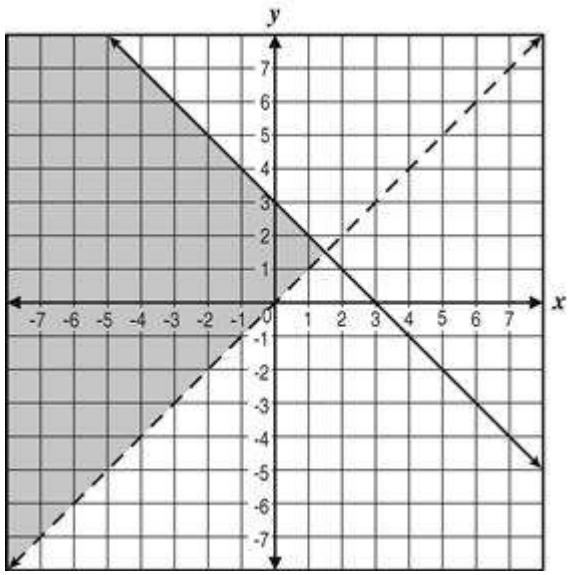
A.



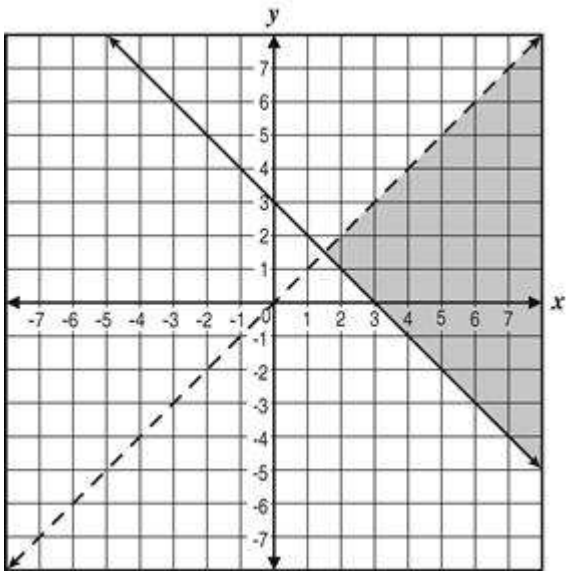
C.



B.



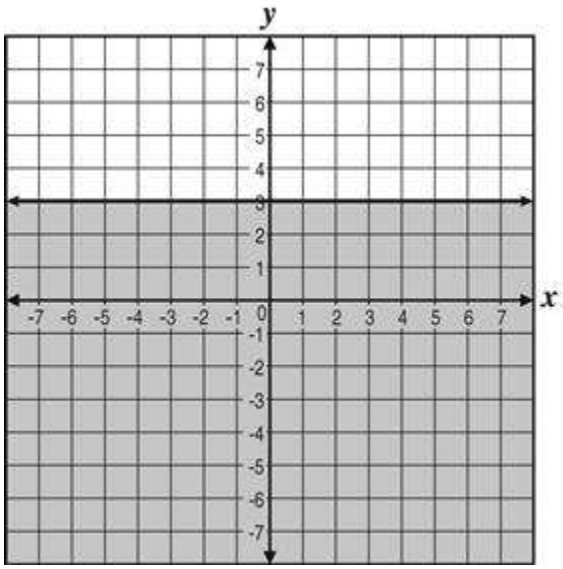
D.



Directions: Answer the following question(s).

Master ID: 148539 Revision: 1
Correct: D
Rationale:
A. Selected the wrong side of the boundary line $y < x$
B. Selected the wrong side of both boundary lines
C. Selected the wrong side of the boundary line, $y \geq -x + 3$
D. **Correct**
Standards:
CCSS.MA.9-12.A-REI.12

10 **Which inequality describes the graph below?**



A. $y - 3 \leq 0$
B. $y + 3 \leq 0$
C. $x - 3 \leq 0$
D. $x + 3 \leq 0$

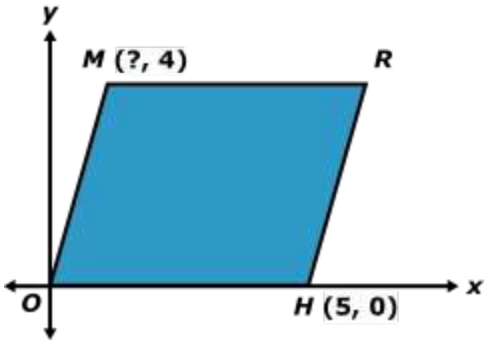
Master ID: 149109 Revision: 1
Correct: A
Rationale:
A. **Correct**
B. Graph is the region below the horizontal line through (0, –3)
C. Graph is the region to the left of the vertical line through (3, 0)
D. Graph is the region to the left of the vertical line through (–3, 0)
Standards:
CCSS.MA.9-12.A-REI.12

Directions: Answer the following question(s).

11 **TEACHER READS:**

Read the question to yourself and select the best answer.

***RHOM* is a rhombus with point *O* at the origin. Find the *x*–coordinate of point *M*.**



A. 1
B. 2
C. 3
D. 4

Master ID: 388454 Revision: 1
Correct: C
Rationale:

A. Student(s) may not have known how to determine the *x*-coordinate of point *M* and used the difference of the *x*-coordinate of point *H* and the *y*-coordinate of point *M* (5 – 4 = 1) for the *x*-coordinate of point *M*.
B. Student(s) may have drawn an auxiliary line from point *M* perpendicular to the *x*-axis and labeled the intersection of this line and the *x*-axis M_X . Student(s) then may have correctly used the Pythagorean Theorem to determine that the length of line segment OM_X, but then over worked the problem by subtracting 3 from 5 (the *x*-coordinate of point *H* to get 2 for the *x*-coordinate of point *M*.
C. Correct answer
D. Student(s) may have incorrectly assumed that since the figure is a rhombus, the *x* and *y*-coordinates of point *M* must be the same.

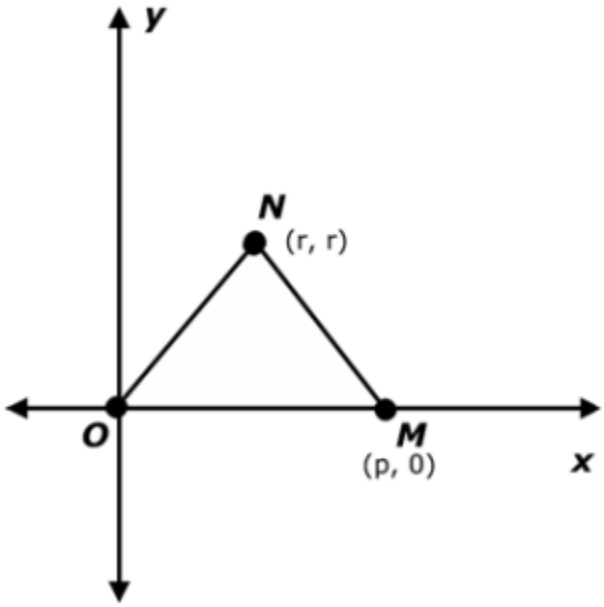
Standards:
CCSS.MA.9-12.G-GPE.4

Directions: Answer the following question(s).

12 **TEACHER READS:**

Read the question to yourself and select the best answer.

The diagram shows Δ*MNO* .



Which of the following must be true if Δ*MNO* is isosceles with base $\overline{OM}$?

A. $p = \frac{r}{2}$

B. $p = r$

C. $p = r\sqrt{2}$

D. $p = 2r$

Master ID: 388568 Revision: 1

Correct: D

Rationale:

A. Student(s) may have known *N* was over the midpoint of $\overline{OM}$ but miswrote the equation relating *r* and *p*.

B. Student(s) may have forgotten *N* was over the midpoint of $\overline{OM}$ or simply guessed.

C. Student(s) may not have realized that while this makes the triangle isosceles, it makes $\overline{NM}$ the base instead of $\overline{OM}$.

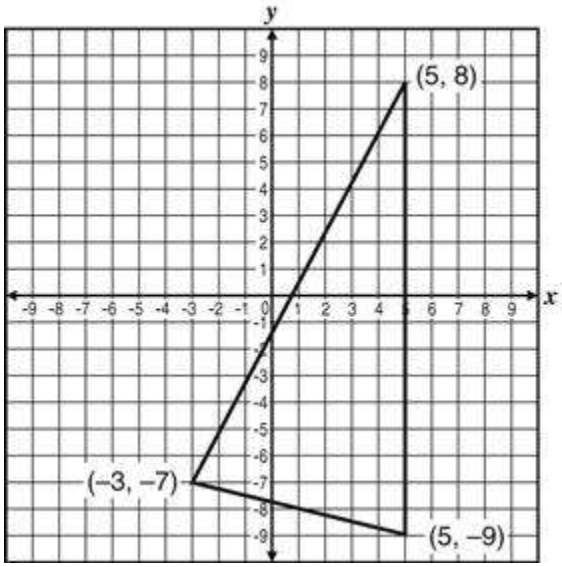
D. Correct answer

Standards:

CCSS.MA.9-12.G-GPE.4

Directions: Answer the following question(s).

13 **An isosceles triangle is shown on the grid below.**



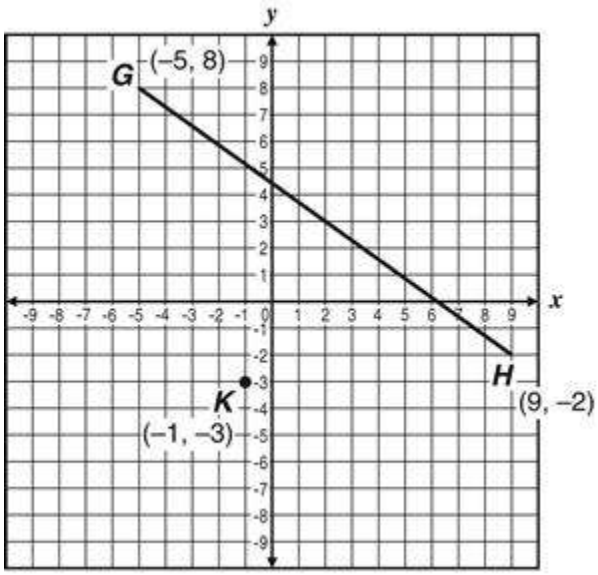
Two congruent right triangles are formed by the intersection of Line *t* (not shown) and the isosceles triangle. What is the slope of Line *t*?

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

Master ID: 154280 Revision: 1
Correct: C
Rationale:
A. Takes the line to intercept $(3, -8)$ instead of $(1, -8)$, and gets the negative of the slope
B. Gets the negative of the slope
C. **Correct**
D. Takes the line to intercept $(-3, 8)$ instead of $(1, -8)$
Standards:
CCSS.MA.9-12.G-GPE.5

Directions: Answer the following question(s).

14 **Line Segment *GH* and Point *K* are shown on the coordinate plane below.**



What is the distance from Point *K* to the midpoint of $\overline{GH}$, to the nearest tenth of a unit?

Input #1 Answers

- 6.7

Master ID:	432713	Revision:	1
Correct:			
Standards:	CCSS.MA.9-12.G-GPE.6		

Directions: Answer the following question(s).

15 **Points *Q*, *R*, and *S* are collinear, and *R* is between *Q* and *S* as shown below.**

If *QS* = 15 units and *RS* = $\frac{1}{3}$ *QR*, what is the length of $\overline{RS}$?

A. $3\frac{3}{4}$ units

B. 5 units

C. 10 units

D. $11\frac{1}{4}$ units

Master ID: 153134 Revision: 1

Correct: A

Rationale:

A. **Correct**

B. Found $\frac{1}{3}$ of 15

C. Found $\frac{2}{3}$ of 15

D. Found the length of $\overline{QR}$

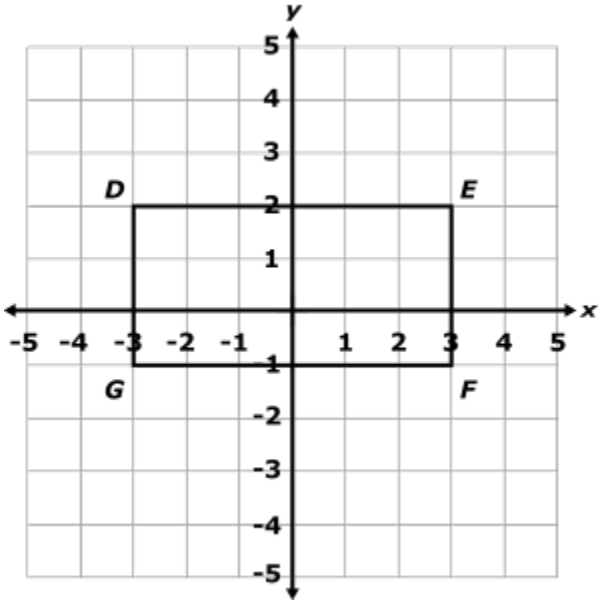
Standards:

CCSS.MA.9-12.G-GPE.6

Directions: Answer the following question(s).

16 **TEACHER READS:**

Read and complete the task that follows.



Determine the area of rectangle *DEFG*, in square units.

Enter the area of rectangle *DEFG*.

[ ] **units^2**

Input #1 Answers

- 18

Master ID: 2231287 Revision: 1

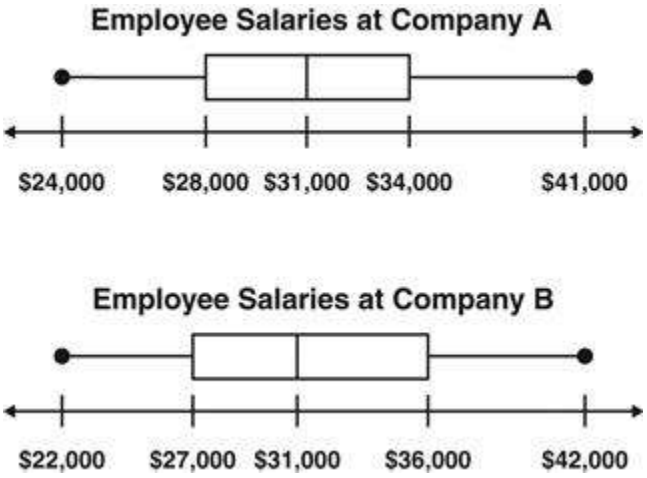
Correct:

Standards:

CCSS.MA.9-12.G-GPE.7

Directions: Answer the following question(s).

17 **The box-and-whisker plots shown below represent the salaries of employees at two different companies.**



What is the difference between the median salaries of the employees at the two companies?

A. $0
B. $500
C. $1,000
D. $2,000

Master ID: 141199 Revision: 1
Correct: A
Rationale:
A. **Correct**
B. Misread the plots
C. Found the difference between the maximum values, or found the difference between the lower quartiles
D. Found the difference between the minimum values, or found the difference between the upper quartiles
Standards:
CCSS.MA.9-12.S-ID.1

Directions: Answer the following question(s).

18 **Jake worked part-time at a store. The amount of money he earned for each of the six weeks is shown below.**

$40, $83, $37, $40, $31, $68

Jake earned $23 for working a seventh week. Which of the following statements is true for these seven weeks?

A. The mean and the median both decrease.
B. The median and the mean both remain the same.
C. The median decreases and the mean remains the same.
D. The mean decreases and the median remains the same.

Master ID: 146501 Revision: 1
Correct: D
Rationale:
A. Found median without reordering.
B. The mean will decrease
C. Confuses mean and median
D. **Correct**
Standards:
CCSS.MA.9-12.S-ID.3

Directions: Answer the following question(s).

19 **The table shows the performance data on a final exam for a random sample of college freshmen.**

Final Exam Sample Results

	A	B	C	D	F	Total
Male	20	46	19	5	3	93
Female	23	44	24	9	7	107
Total	43	90	43	14	10	200

Based on the data, which conclusion is NOT valid?

A. Given that a randomly selected student is a male, the probability that the student received a D on the final exam is approximately 5.4%.

B. Given that a randomly selected student is a female, the probability that the student received an A on the final exam is approximately 11.5%.

C. Given that a randomly selected student received a B on the final exam, the probability that the student is a male is approximately 51.1%.

D. Given that a randomly selected student received a C on the final exam, the probability that the student is a female is approximately 55.8%.

Master ID: 155854 Revision: 1

Correct: B

Rationale:

A. This statement is valid

B. **Correct**

C. This statement is valid

D. This statement is valid

Standards:

CCSS.MA.9-12.S-ID.5

Directions: Answer the following question(s).

20 **In a survey, a random selection of 2,757 adults was asked whether they identified more strongly with political Party A, Party B, or Party C. The table shows the results of the survey broken down by gender.**

Survey Results

	Party A	Party B	Party C	Total
Females	762	327	468	1557
Males	484	239	477	1200
Total	1246	566	945	2757

Based on the results from the survey, which conclusion is valid?

A. Approximately 45% of adults identify most strongly with Party A.
B. Approximately 42% of the males identify themselves with Party B.
C. Approximately 50% of the males identify most strongly with Party C.
D. Approximately 61% of the females identify most strongly with Party A.

Master ID: 155853 Revision: 1
Correct: A
Rationale:
A. **Correct**
B. Approximately 42% of the adults surveyed who identified themselves with Party B were males
C. Approximately 50% of the adults surveyed who identified themselves with Party C were males
D. Approximately 61% of the adults surveyed who identified themselves with Party A were females
Standards:
CCSS.MA.9-12.S-ID.5

Directions: Answer the following question(s).

21 **Treatment for feline hyperthyroidism involves a single dose of radioactive iodine. The amount of radioactive iodine remaining following treatment is shown in the table.**

Radioactive Iodine Remaining after Treatment

Time (days)	Amount of Radioactivity (mCi)
0	3
8	1.5
16	0.75

About how much radioactivity will still remain 20 days after treatment?

A. 0.0 mCi
B. 0.38 mCi
C. 0.53 mCi
D. 0.60 mCi

Master ID: 1907050 Revision: 1
Correct: C
Rationale:
A. Used first two data points to find linear model
B. Used second two data points to find linear model
C. **Correct**
D. Used inversely proportional relationship from second two data points
Standards:
CCSS.MA.9-12.S-ID.6.a

Directions: Answer the following question(s).

22 **TEACHER READS:**

Read and complete the task that follows.

To save for his first house, Patrick established a savings account that is not earning any interest. He planned to invest money according to the formula *y* = 225*x* + 150, where *y* represents the total amount of money in his account and *x* represents the number of months since he started investing.

Complete the table below to determine the correct amounts.

	Amount
Amount of money in the account after 2 years	
Amount of money invested in the account per month	
Amount of money in the account when it was first opened	

Input #1 Answers

- 5550
- 5,550

Input #2 Answers

- 225

Input #3 Answers

- 150

Master ID: 2268736 Revision: 1
Correct:
Standards:
CCSS.MA.9-12.S-ID.7

23 A banquet hall's cost to rent is represented by the function $y = 15x + 100$, where *x* is the number of people. What is the *best* interpretation of the constant term in this function?

A. the cost per person
B. the total number of people at the banquet
C. the setup fee for the banquet
D. the total cost of the banquet

Master ID: 572051 Revision: 1
Correct: C
Standards:
CCSS.MA.9-12.S-ID.7

Directions: Answer the following question(s).

24 **TEACHER READS:**

Read the question to yourself and select the best answer.

A swim team collects data on the number of laps each member swims in the pool and the time it takes to swim those laps. The team plots their data on a scatter plot. Which statement *most likely* interprets their results?

A. There is likely to be correlation between the number of laps and the time it takes to swim those laps but not causation.

B. There is likely to be causation between the number of laps and the time it takes to swim those laps but not correlation.

C. There is likely to be both correlation and causation between the number of laps and the time it takes to swim those laps.

D. There is likely to be neither correlation nor causation between the number of laps and the time it takes to swim those laps.

Master ID: 463791 Revision: 1

Correct: C

Rationale:

A. Student(s) may have understood that the scatter plot would show a linear trend but may not have realized that the correlation has an underlying causation.

B. Student(s) may not have realized that two variables that have a causal relationship will also have a correlation.

C. Correct answer

D. Student(s) may not have realized that a relationship exists between the number of laps and the time it takes to swim those laps.

Standards:

CCSS.MA.9-12.S-ID.9

Directions: Answer the following question(s).

25 **Which statement is the BEST hypothesis to be tested for a causal relationship?**

A. Students drink more bottles of water based on the time of day.
B. Students drink more bottles of water when they are exercising.
C. Students drink more bottles of water when the price is lower.
D. Students drink more bottles of water after a major test.

Master ID: 196602 Revision: 1
Correct: B
Rationale:
A. Assumed time of day causes people to drink water
B. **Correct**
C. Assumed lower prices cause people to drink more water
D. Assumed a test causes people to drink water
Standards:
CCSS.MA.9-12.S-ID.9

Directions: Answer the following question(s).

26 **TEACHER READS:**

Read the question to yourself and select the best answer(s).

The two equations below represent a system of linear equations.

Equation 1: $3x - 4y = 5$
Equation 2: $-2x + 3y = -4$

Tabitha claims that replacing Equation 2 with a different equation sometimes produces a new system with the same solution. Which of the following equations can be used to support this claim? Select *all* that apply.

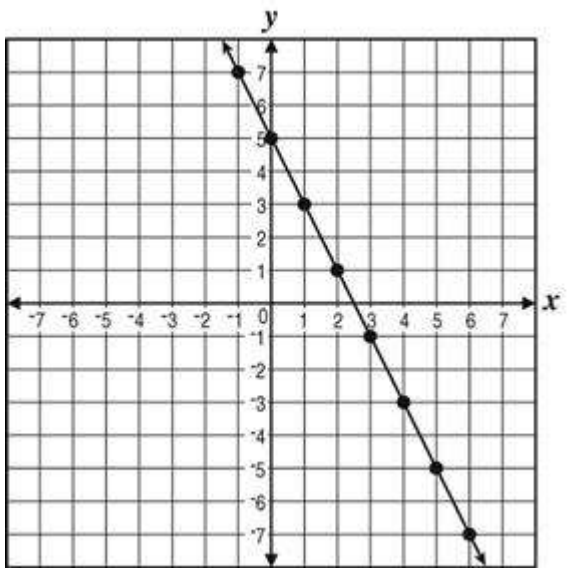
A. $-20x + 27y = -34$
B. $-5x + 7y = -9$
C. $x - y = 1$
D. $9x - 12y = 15$

Master ID: 2035687 Revision: 1
Correct: ABC
Rationale:
A. Correct answer
B. Correct answer
C. Correct answer
D. Student(s) may have replaced Equation 2 with a multiple of Equation 1, resulting in a system with infinite solutions.
Standards:
CCSS.MA.9-12.A-REI.5

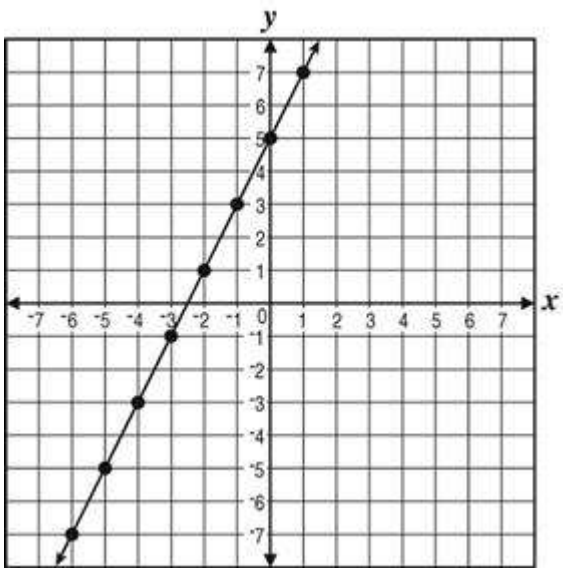
Directions: Answer the following question(s).

27 **Which graph represents the function $y = -2x + 5$?**

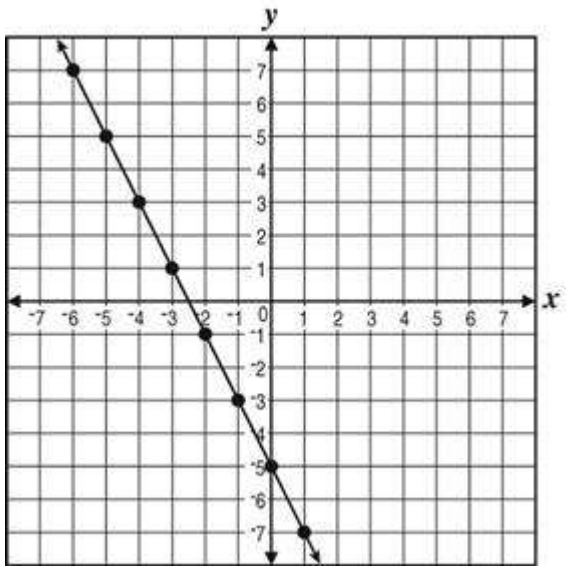
A.



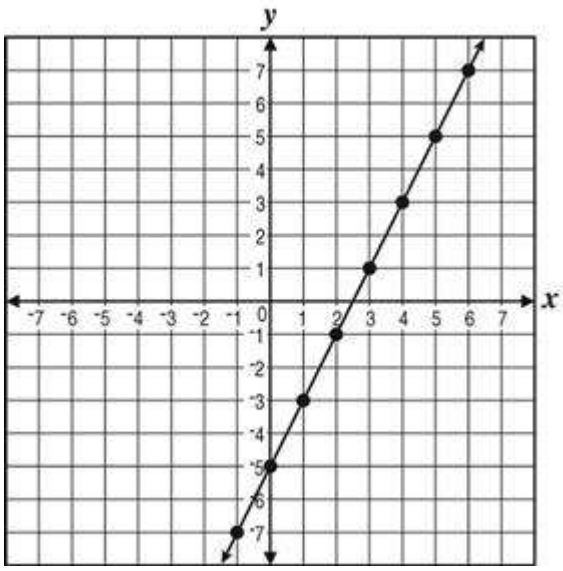
C.



B.



D.



Master ID: 150012 Revision: 1

Correct: A

Rationale:

A. **Correct**
B. Chose a graph with a negative *y*-intercept
C. Chose a graph with a positive slope
D. Chose a graph with a positive slope and a negative *y*-intercept

Standards:

CCSS.MA.9-12.A-REI.10

Directions: Answer the following question(s).

28 **TEACHER READS:**

Read the question to yourself and select the best answer.

Which of the following could be the equation of a line parallel to the line $3x + 2y = -4$?

A. $2x + 3y = 7$

B. $-3x + 2y = 5$

C. $3x + 2y = 3$

D. $2x - 3y = 4$

Master ID: 409504 Revision: 1

Correct: C

Rationale:

A. Student(s) may have thought the slope of a parallel line was the reciprocal of the given line's slope.

B. Student(s) may have thought slope of a parallel line was the negative of the given line's slope.

C. Correct answer

D. Student(s) may have thought the question asked for a perpendicular equation to the given equation.

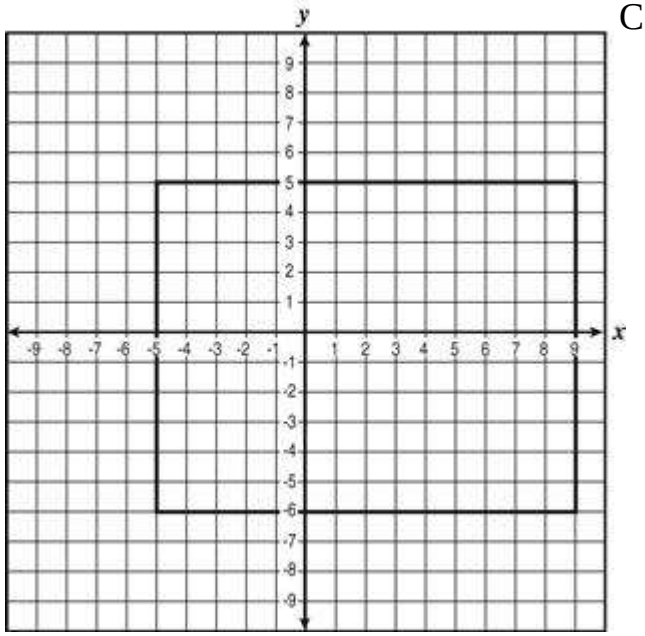
Standards:

CCSS.MA.9-12.G-GPE.5

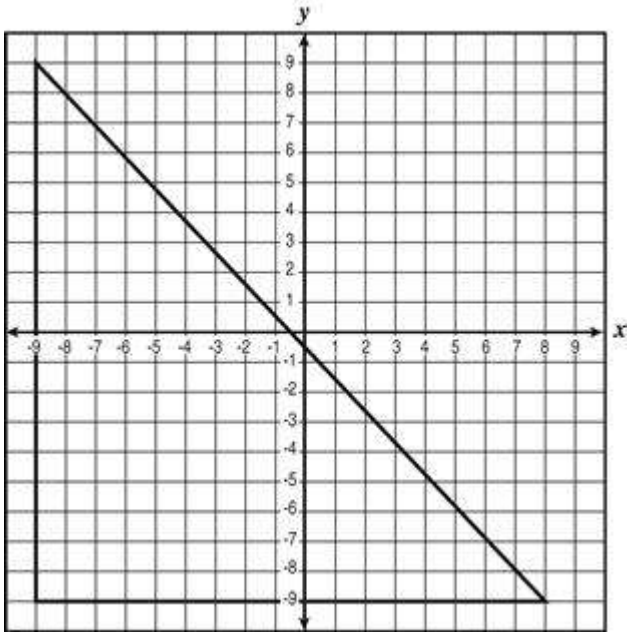
Directions: Answer the following question(s).

29 **Which of the following polygons has the LEAST area?**

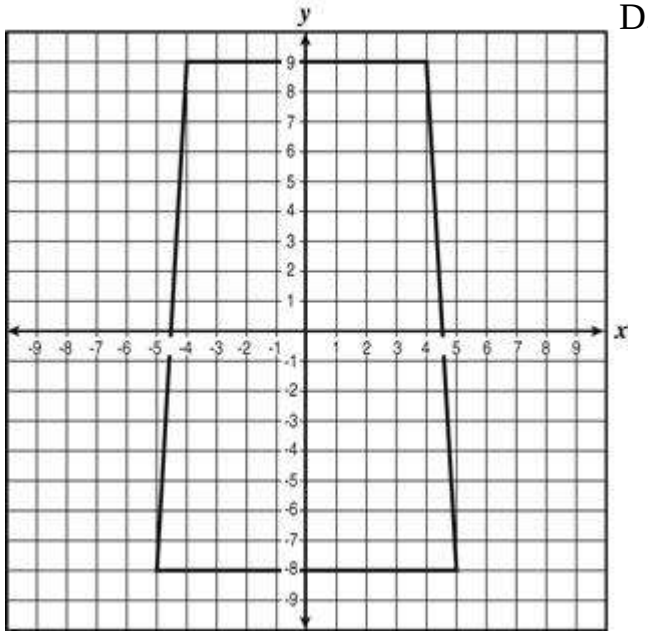
A.



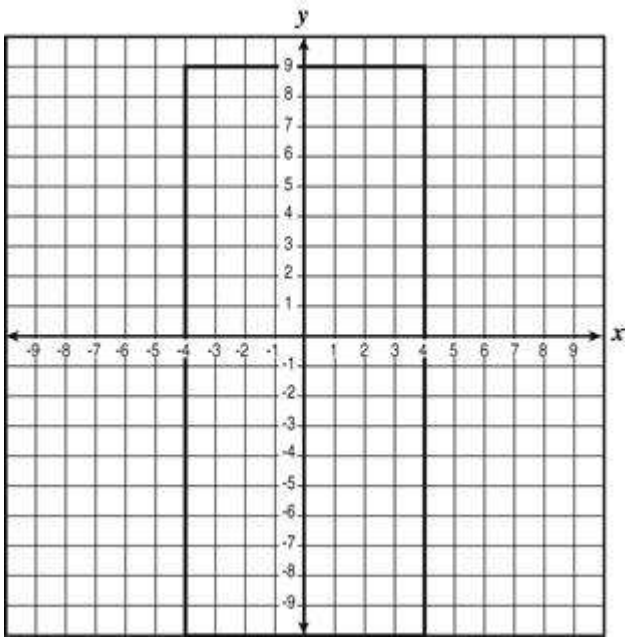
C.



B.



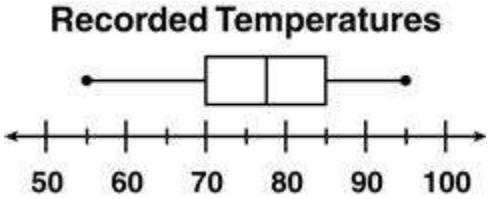
D.



Directions: Answer the following question(s).

Master ID: 152571 Revision: 1
Correct: D
Rationale:
A. $14 \times 11 = 154$
B. $\left(\frac{(8+10)}{2}\right) \times 17 = 153$
C. $\frac{18 \times 17}{2} = 153$
D. **Correct**
Standards:
CCSS.MA.9-12.G-GPE.7

30 **Jerry recorded the outdoor temperature at noon on the first day of each month for one year. He made the box-and-whisker plot below to display his data.**



What is the range of temperatures?

A. 40
B. 55
C. 70
D. 95

Master ID: 144070 Revision: 1
Correct: A
Rationale:
A. **Correct**
B. Minimum
C. Q1; lower quartile
D. Maximum
Standards:
CCSS.MA.9-12.S-ID.1

Directions: Answer the following question(s).

31 **A beauty shop owner collected data on various services provided to clients. The table below shows the number of haircuts and highlights that each hairstylist provided to clients last month.**

Beauty Shop Services

Hairstylist	Haircuts	Highlights
Anna	20	20
Cara	72	25
Darren	35	36
Joyce	42	21
Kiana	64	46
Layla	42	48
Millie	71	37
Niki	66	50
Ray	64	51
Reza	64	52
Steve	44	47
Tonya	46	46

The owner concluded that the median number of haircuts and the median number of highlights provided by the hairstylists was 46. What error did the owner make?

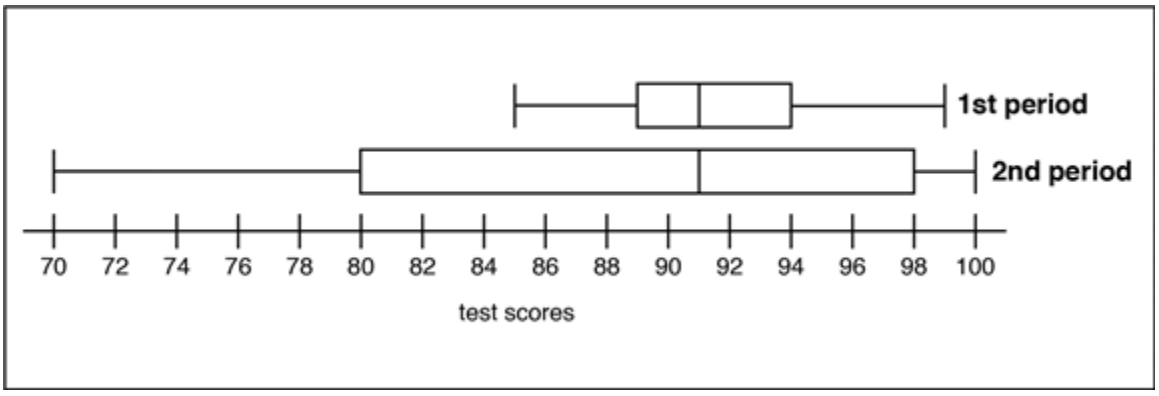
A. She confused the range and the median for each set of data.
B. She deleted repeating numbers when ordering the numbers.
C. She confused the mode for the median in the haircut data set.
D. She chose the number in the middle of the table as the median.

Master ID: 154129 Revision: 1
Correct: B
Rationale:
A. Neither range is 46
B. **Correct**
C. Mode for haircuts is 64 not 46
D. 46 does not appear in mid-table
Standards:
CCSS.MA.9-12.S-ID.2

Directions: Answer the following question(s).

32 **Select the answer from the menu.**

Mr. Fowler created two box plots to display the test scores from his first- and second-period classes.



The first-period class had a [ ] than the second-period class.

A. lower median
B. higher median
C. lower interquartile range
D. higher interquartile range

Master ID: 331593 Revision: 1
Correct: C
Rationale:
A. Misreads the box plots or does not understand median
B. Misreads the box plots or does not understand median
C. **Correct**
D. Confuses the two data sets or does not understand interquartile range
Standards:
CCSS.MA.9-12.S-ID.2

Directions: Answer the following question(s).

33 Johnny had 5 quizzes in his Algebra class. His first 4 scores are shown in the table.

Quiz 1	89
Quiz 2	91
Quiz 3	92
Quiz 4	88
Quiz 5	

Johnny makes a 53 on Quiz 5. Which value will be least affected?

A. mean
B. range
C. median
D. standard deviation

Master ID: 2083099 Revision: 1
Correct: C
Standards:
CCSS.MA.9-12.S-ID.3

Directions: Answer the following question(s).

34 **Jules kept track of her cab fare in the table below.**

Cost of Cab Rides

Distance Traveled (miles)	Cost ($)
7	16.20
3.4	9.00
4	10.20
5.6	13.40

The linear model $c = 2.20 + 2m$ describes the cost of the cab ride, *c*, as a function of the number of miles traveled, *m*. How much will it cost Jules to travel 16 miles in a cab?

A. $32.00
B. $34.20
C. $35.20
D. $37.20

Master ID: 1907047 Revision: 1
Correct: B
Rationale:
A. Found 2*m*
B. **Correct**
C. Found 2.2*m*
D. Found 2 + 2.2*m*
Standards:
CCSS.MA.9-12.S-ID.6.a