

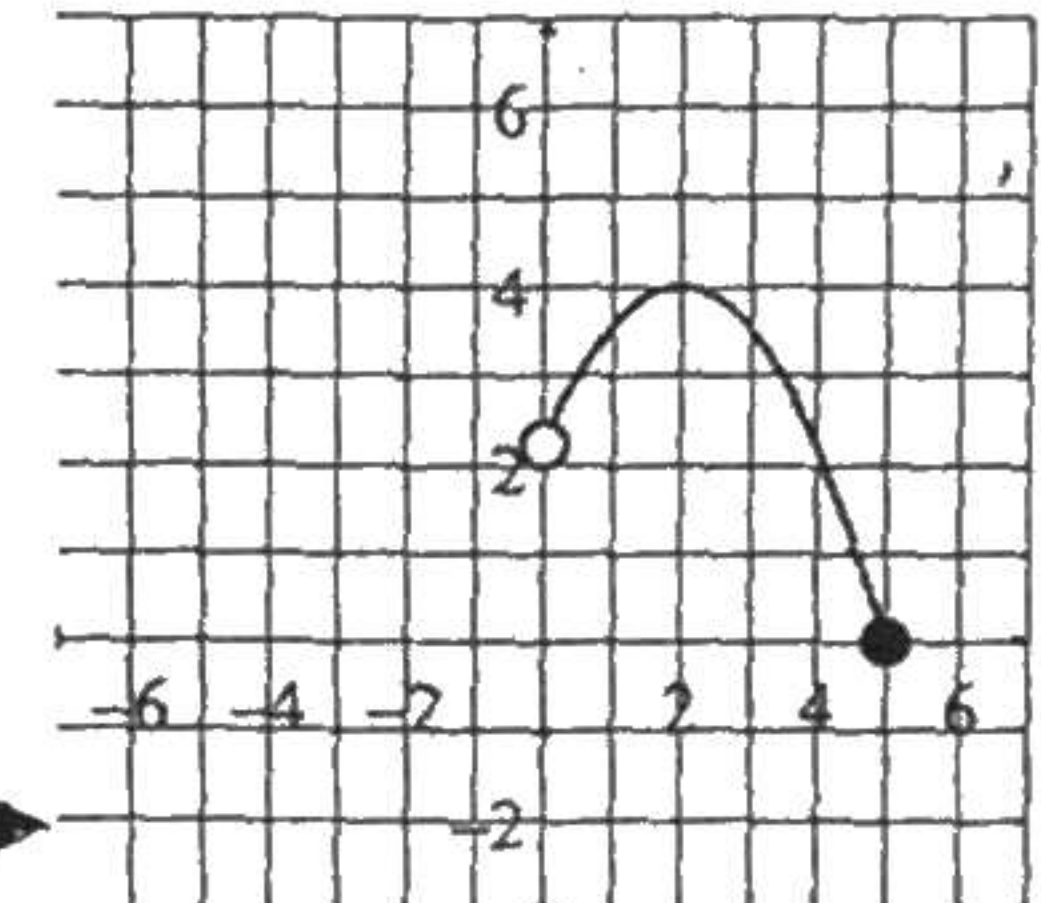
Note: Most of the examples on this page came from the TEA booklet of sample EOC problems, so these should very closely resemble the type of problems you will be working on the actual test in May.

1. A relation is a set of ordered pairs such as (x, y) .
 - a. The x is called the independent variable and the y is the dependent variable.
 - b. The domain is the set of all values of the independent variable, and the range is the set of all values of the dependent variable.
2. A function is a relation in which each element of the domain is mapped to exactly one element of the range. Informally, in a function, each x has exactly one y .

Example 1: The cost of shipping a package is a function of its weight. There is a fixed cost of \$4 and an additional cost of \$0.75 for each pound the package weighs. For this function, identify the independent and dependent quantities.

Example 2: Which of the following is a function (more than one may be a function)?

- a. $\{(0,0), (1,1), (2,2)\}$ b. $\{(0,0), (1,2), (2,0)\}$ c. $\{(0,0), (0,1), (0,2)\}$



Example 3: State the domain and range of the graph pictured to the right.

3. The equation of any linear function can be written in slope-intercept form, $y = mx + b$.
 - a. In this equation, $m = \frac{\text{Change in } y}{\text{Change in } x}$ represents the slope of the line. In general, a slope will represent a rate of change and will have units containing the word "per," as "feet per second" or "dollars per hour."
 - b. Lines that are parallel have the same slope. Lines that are perpendicular have slopes that are opposite reciprocals (like 2 and $-\frac{1}{2}$).
 - c. The b represents the y-intercept of the graph, which generally represents some kind of starting value of the function.

Example 4: If $(2k+1, k-3)$ and $(2k-4, k+5)$ are two points on the graph of a line, what is the slope of the line?

Example 5: What is the slope of the line given by the equation $11y + 14 = -41x$

Example 6: The amount an appliance repairman charges for each job is represented by the function $t = 50h + 35$, where h represents the number of hours he spent on the job and t represents the total amount he charges in dollars for the job. The repairman plans to change the amount he charges for each job. The amount he plans to charge is represented by the function $t = 50h + 45$. What will be the effect of this change on the amount he charges for each job?

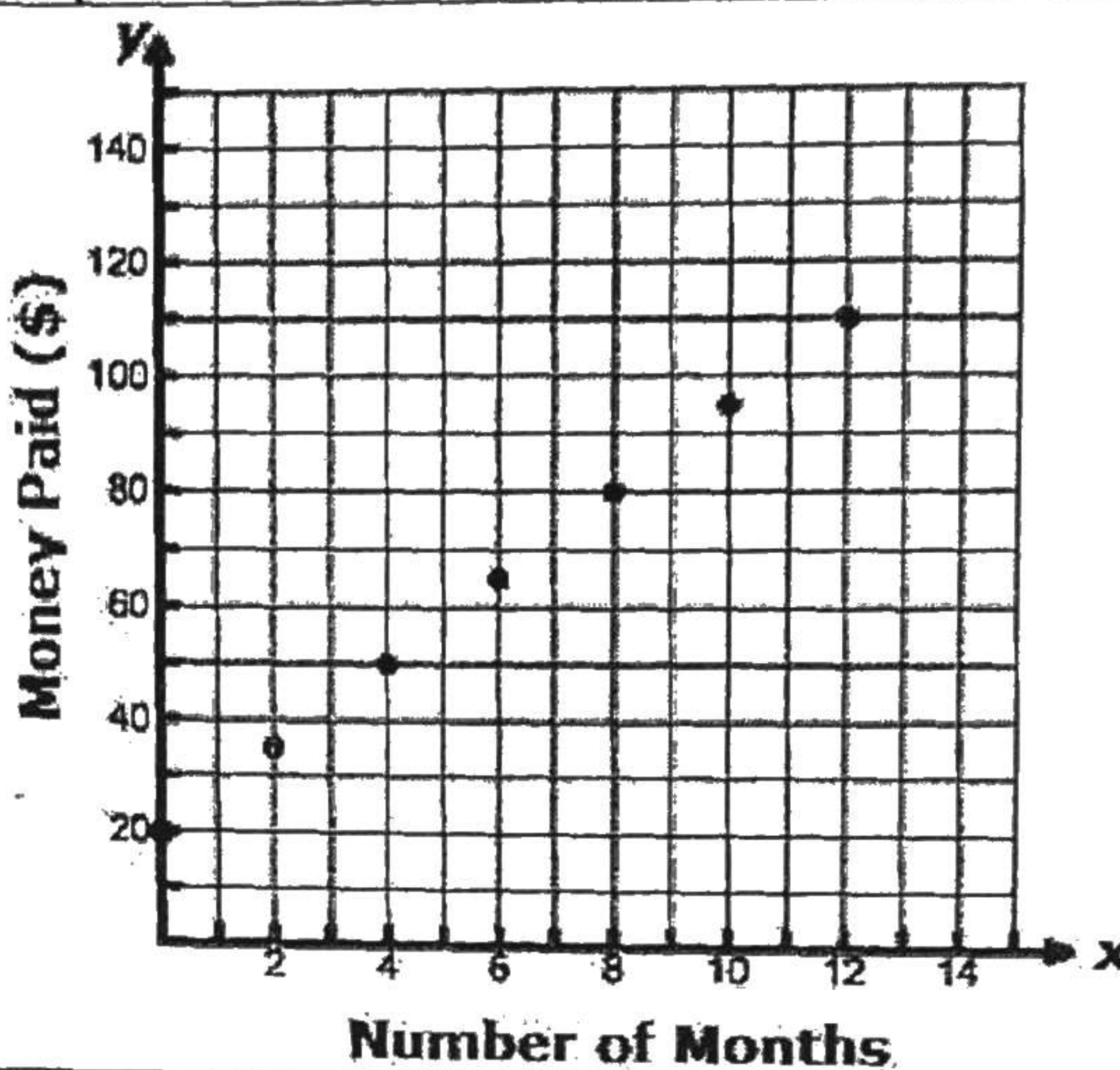
4. When given the slope of a line and a point through which the line passes, it is often convenient to use point-slope form to write the equation of the line. The equation in point-slope form of the line that passes through the point (x_1, y_1) with slope m is $y - y_1 = m(x - x_1)$.

Example 7: What is the y -intercept of the line passing through $(-4, 7)$ with a slope of $\frac{4}{5}$?

The amount an appliance repairman charges for each job is represented by the function $t = 50h + 35$ where h represents the number of hours he spent on the job and t represents the total amount he charges in dollars for the job. The repairman plans to change the amount he charges for each job. The amount he plans to charge is represented by the function $t = 50h + 45$. What is the effect of this change on the amount he charges for each job?

- [A] The total amount he charges for each job will increase by \$10.
 [B] The total amount he charges for each job will decrease by \$10.
 [C] The amount he charges per hour will increase by \$10.
 [D] The amount he charges per hour will decrease by \$10.

1) John pays an initial fee of \$20 to join an unlimited movie rental service. There is an additional cost of \$15 every two months to maintain the membership. The graph here shows how much money John paid during the year.



Which of the following describes the range of the graph?

- [A] {0,2,4,6,8,10,12}
- [B] {20,35,50,65,80,95,110}
- [C] {0,20,2,35,4,50,6,65,8,80,10,95,12,110}
- [D] {20,40,60,80,100,120,140}

2) Which of the following equations is equivalent to the function $f(x) = 4x - 5$?

- [A] $y = 4x + 5$
- [B] $y = -4x + 5$
- [C] $y = -4x - 5$
- [D] $y = 4x - 5$

3) Custom Shirts will print T-shirts for the high school band boosters for a \$125 set up fee and \$12.50 per shirt. Which expression could be used to find the cost of any number of shirts, s , printed for the band boosters?

- [A] $125s + 12.50s$
- [B] $125s + 12.50$
- [C] $125 + 12.50s$
- [D] $12.50s - 125$

4) Which of the following tables does NOT represent a function?

[A]

n	b
-3	-1
-2	1
-1	3
0	5
1	7

[B]

n	b
-3	1
-2	3
-1	5
0	7
1	9

[C]

n	b
-3	-1
-2	1
-1	5
0	7
-1	9

[D]

n	b
-3	-1
-2	1
-1	1
0	3
1	5

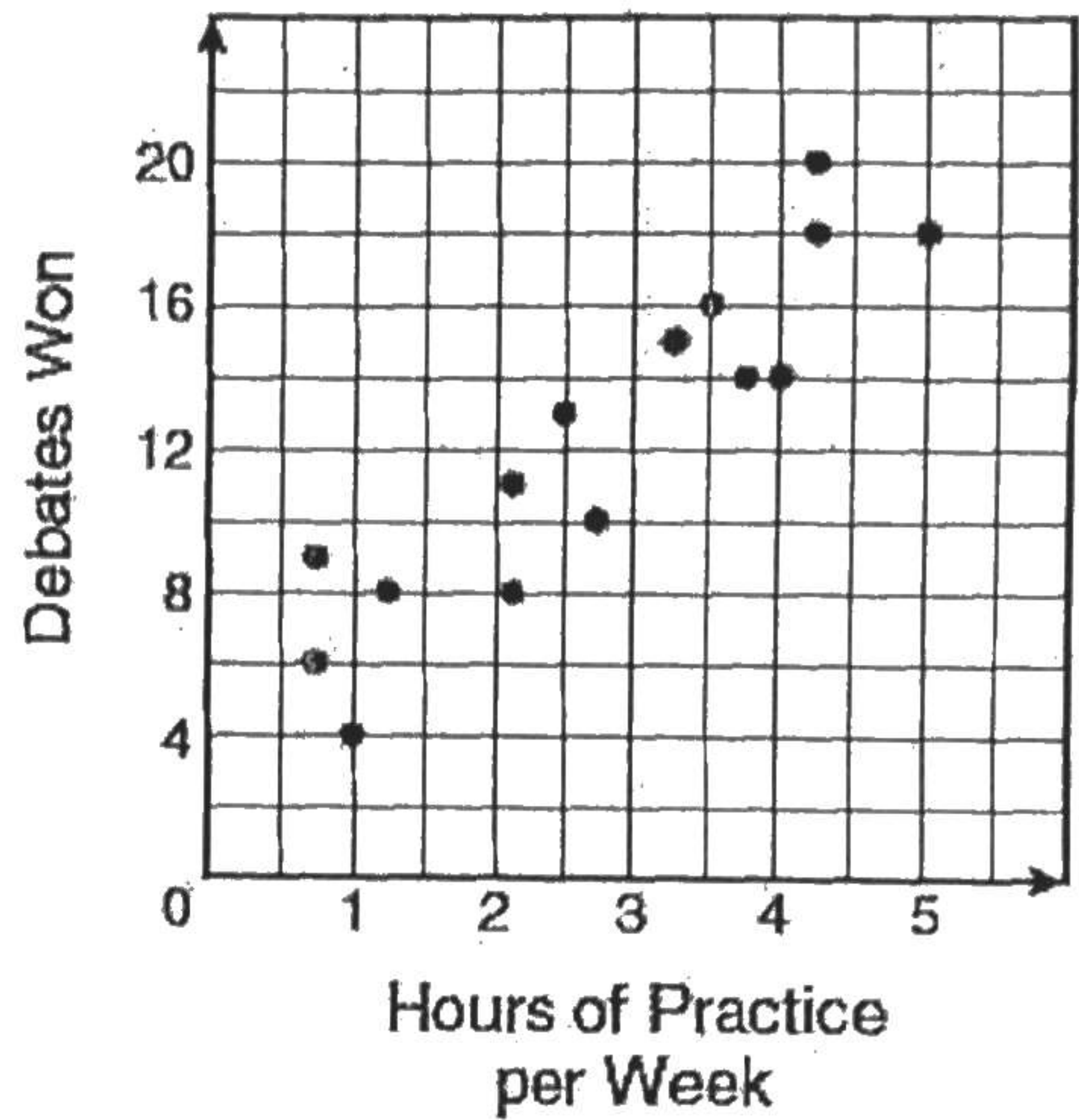
5) The cost, including tax, of renting a truck at a local rental agency is \$58 per day plus \$0.25 for each mile driven. Mr. Willis rented a truck from this agency for 2 days and drove it m miles. Which equation can he use to determine the total cost, c ?

- [A] $c = 0.25 + 58m$
- [B] $c = 116 + 0.25m$
- [C] $c = 116 - 0.25m$
- [D] $c = 58 + 0.25m$

6) The coaches of a group of debate teams answered a survey about hours of debate team practice and number of team wins. The graph shows the results of this survey.

Based on these results, if a team practices 6 hours per week next season, which is the best estimate of the number of debates the team can expect to win?

- [A] 1 [B] 18
 [C] 20 [D] 24



7) Jose works at a grocery store after school. He is paid \$6.50 per hour. His weekly paycheck, p , is described by the function $p = 6.5h$, where h is the number of hours he works in a week. What is the independent quantity in this functional relationship?

- [A] The number of hours he works in a week [B] The number of dollars he is paid per hour
 [C] The total paycheck for a week [D] The number of days he works in a week.

8) Diana will enclose her rectangular tomato garden with 42 feet of fencing material. She wants the length of her garden to be two times the width. What length will meet Diana's conditions?

- [A] 28 feet [B] 21 feet [C] 14 feet [D] 7 feet

9) Josie and Katrina went to Blaire's accessory shop to buy bracelets on sale for \$10, tax included. Josie purchased three and a half times as many bracelets as Katrina purchased. Together they purchased 18 bracelets. Which system of linear equations can be used to determine j , the number of bracelets Josie purchased, and k , the number of bracelets Katrina purchased?

- [A] $\begin{cases} 10j + 10k = 18 \\ j = \frac{7}{2}k \end{cases}$ [B] $\begin{cases} j + k = 18 \\ k = \frac{7}{2}j \end{cases}$ [C] $\begin{cases} 10j + 10k = 18 \\ k = \frac{7}{2}j \end{cases}$ [D] $\begin{cases} j + k = 18 \\ j = \frac{7}{2}k \end{cases}$

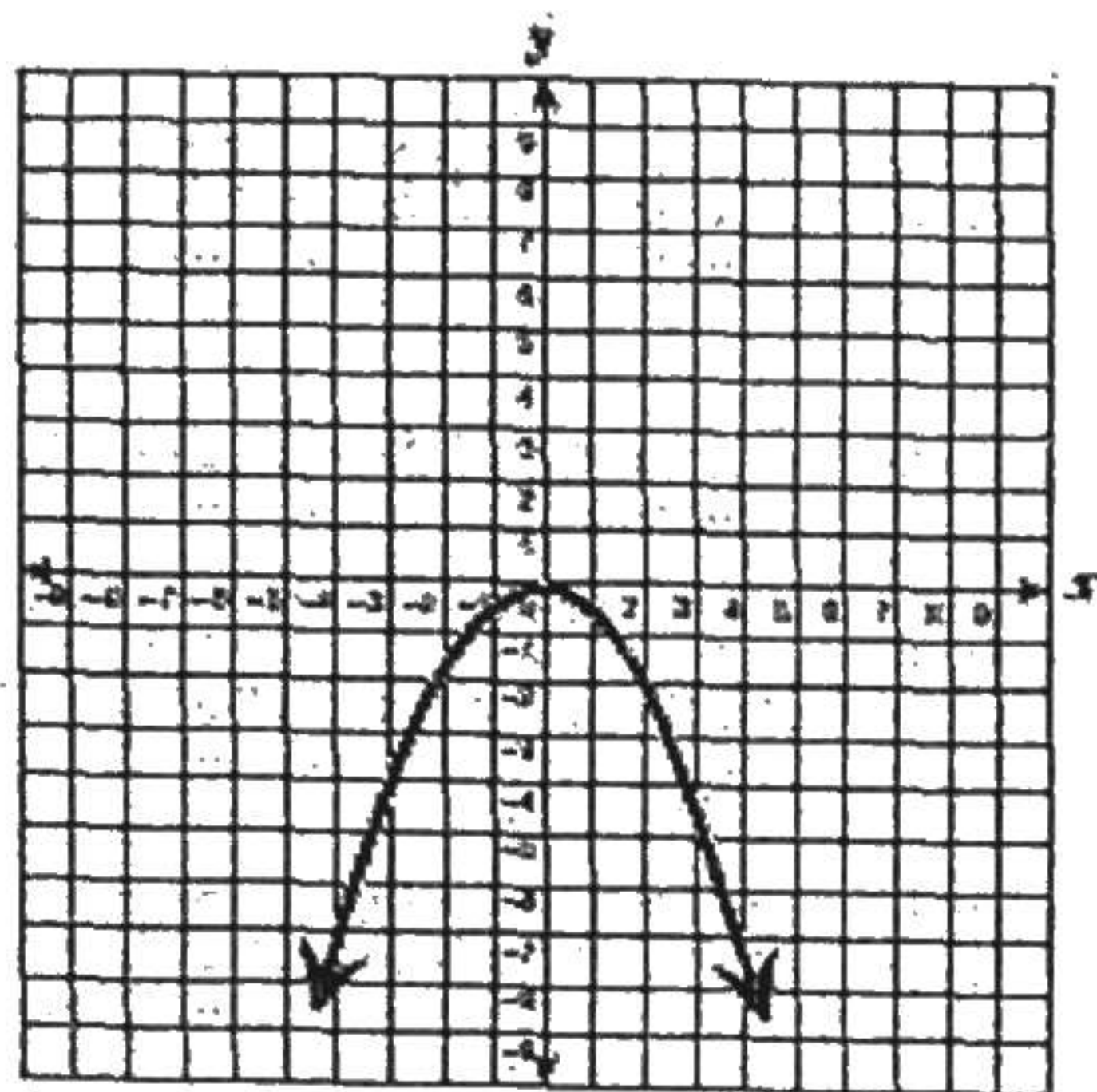
10) What is the value of y in the solution to the system of linear equations $\begin{cases} 3x + 2y = 15 \\ 4x - 2y = 20 \end{cases}$?

- [A] 5 [B] 0 [C] 2 [D] 15

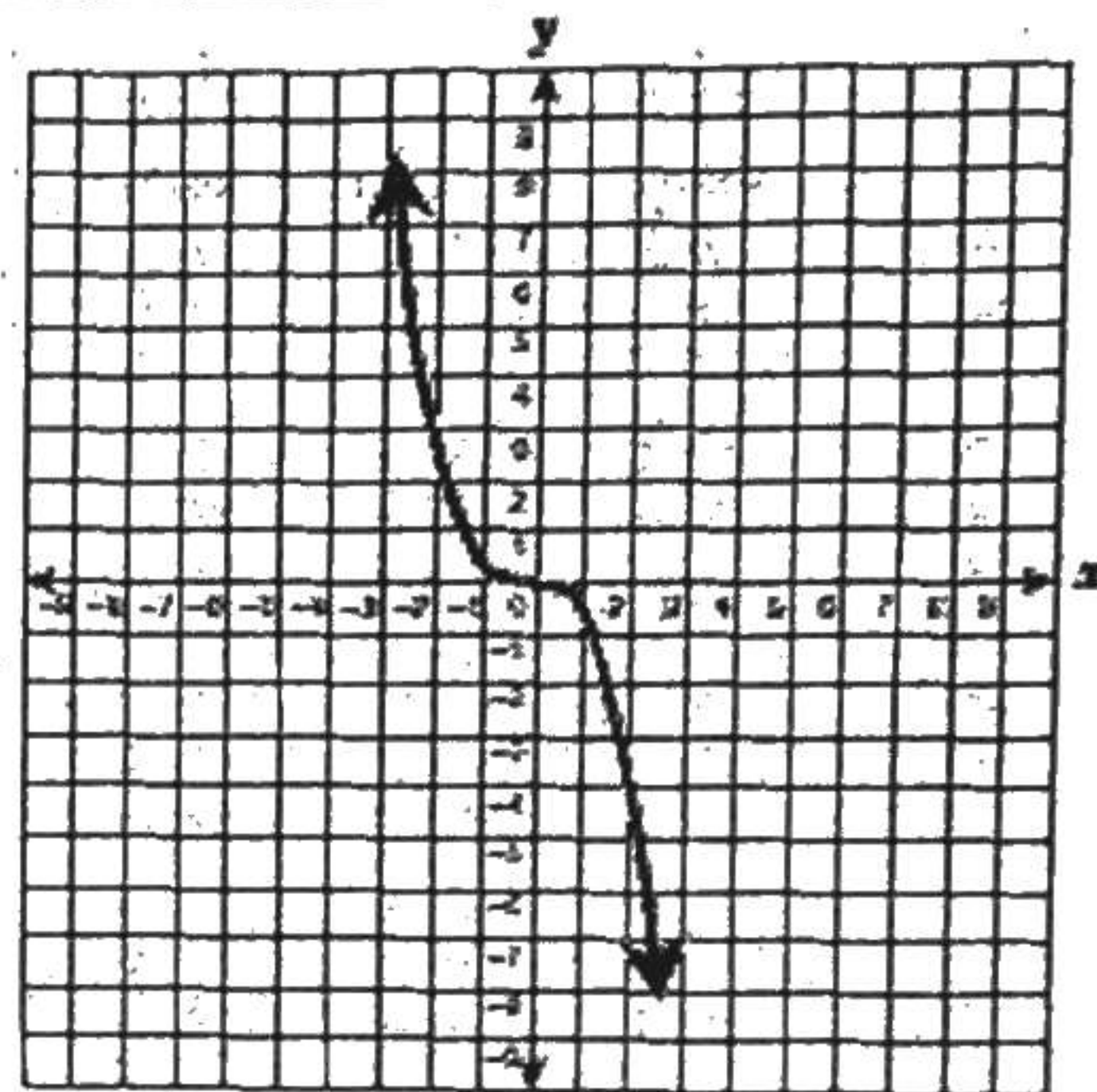
11) Which graph best represents the relationship shown in the table here?

x	-1	0	1	2
y	0.5	0	-0.5	-4

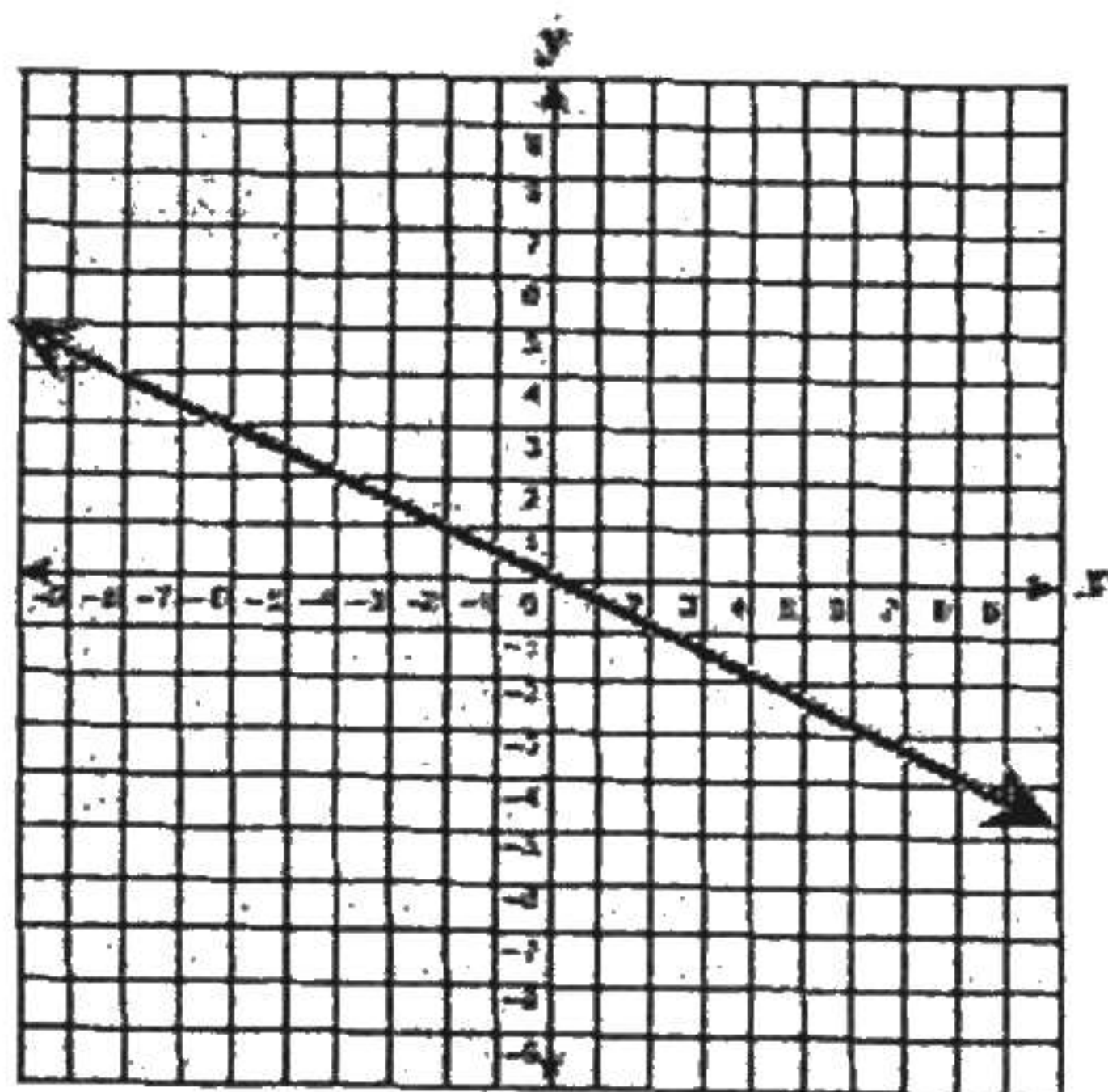
[A]



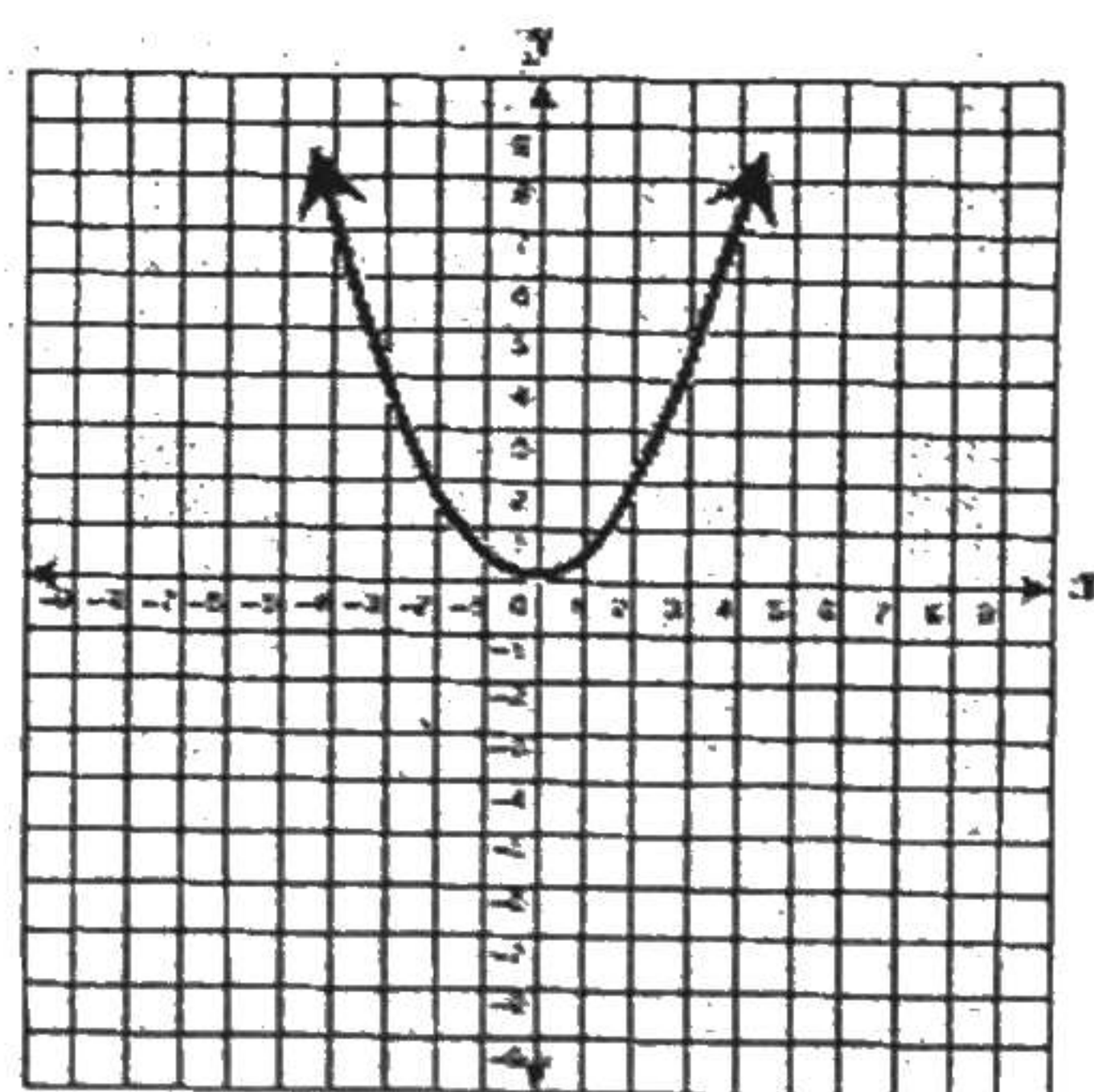
[B]



[C]



[D]

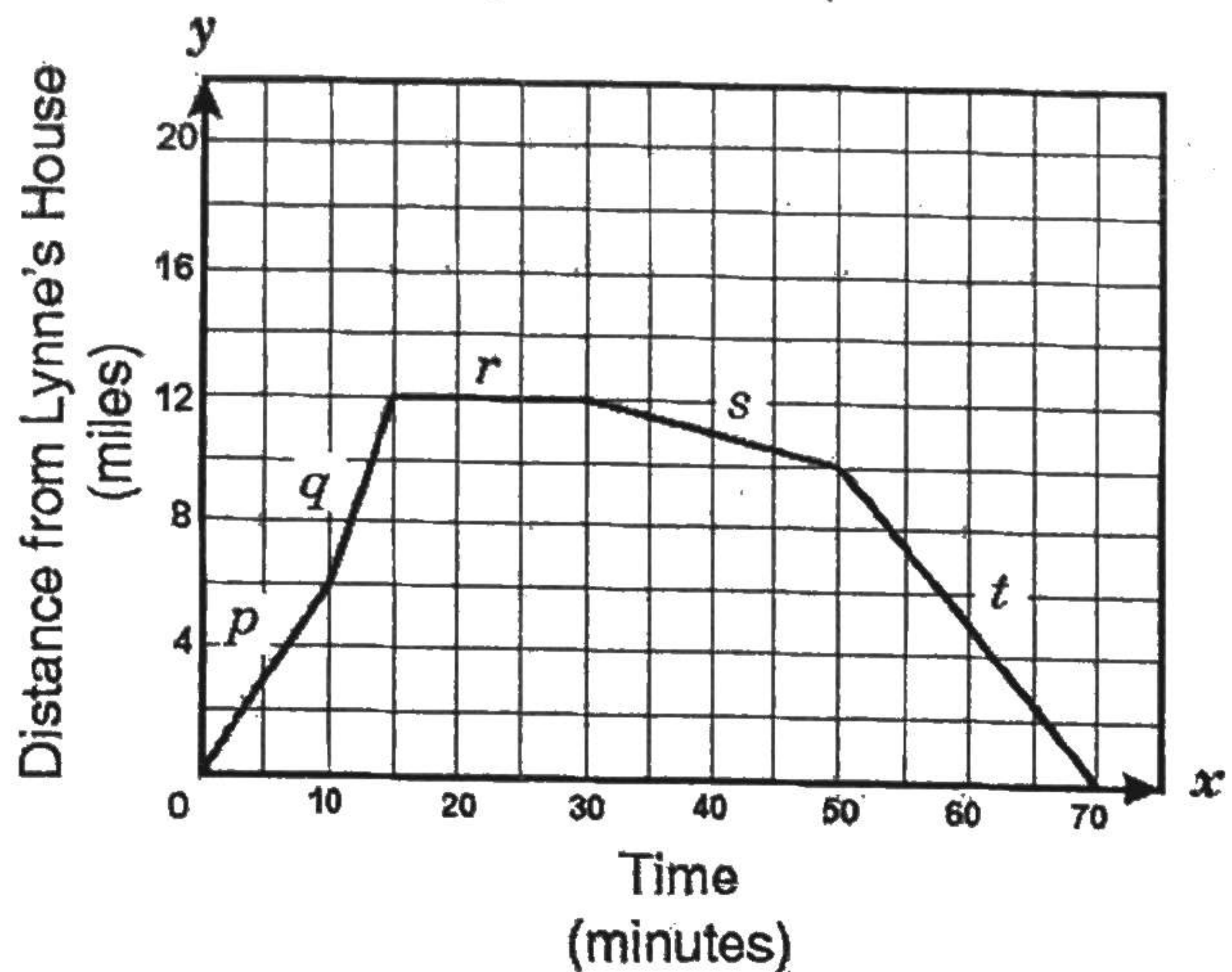


12) The graph here represents Lynne's trip from her house to the mall and then back to her house.

Which statement is NOT true based on the data in the graph?

- [A] Lynne stayed at the mall for 15 minutes.
- [B] The trip home from the mall took longer than the trip to the mall from home.
- [C] It took Lynne 20 minutes to arrive at the mall from her house.
- [D] Lynne stayed at the mall the same length of time as the time it took to drive to the mall.

Lynne's Car Trip



13) James graphs the equations $2x - y = -7$ and $2x - y = 5$. Which of the following best describes the solutions to this system of equations?

[A] There is one solution at $(7, -5)$

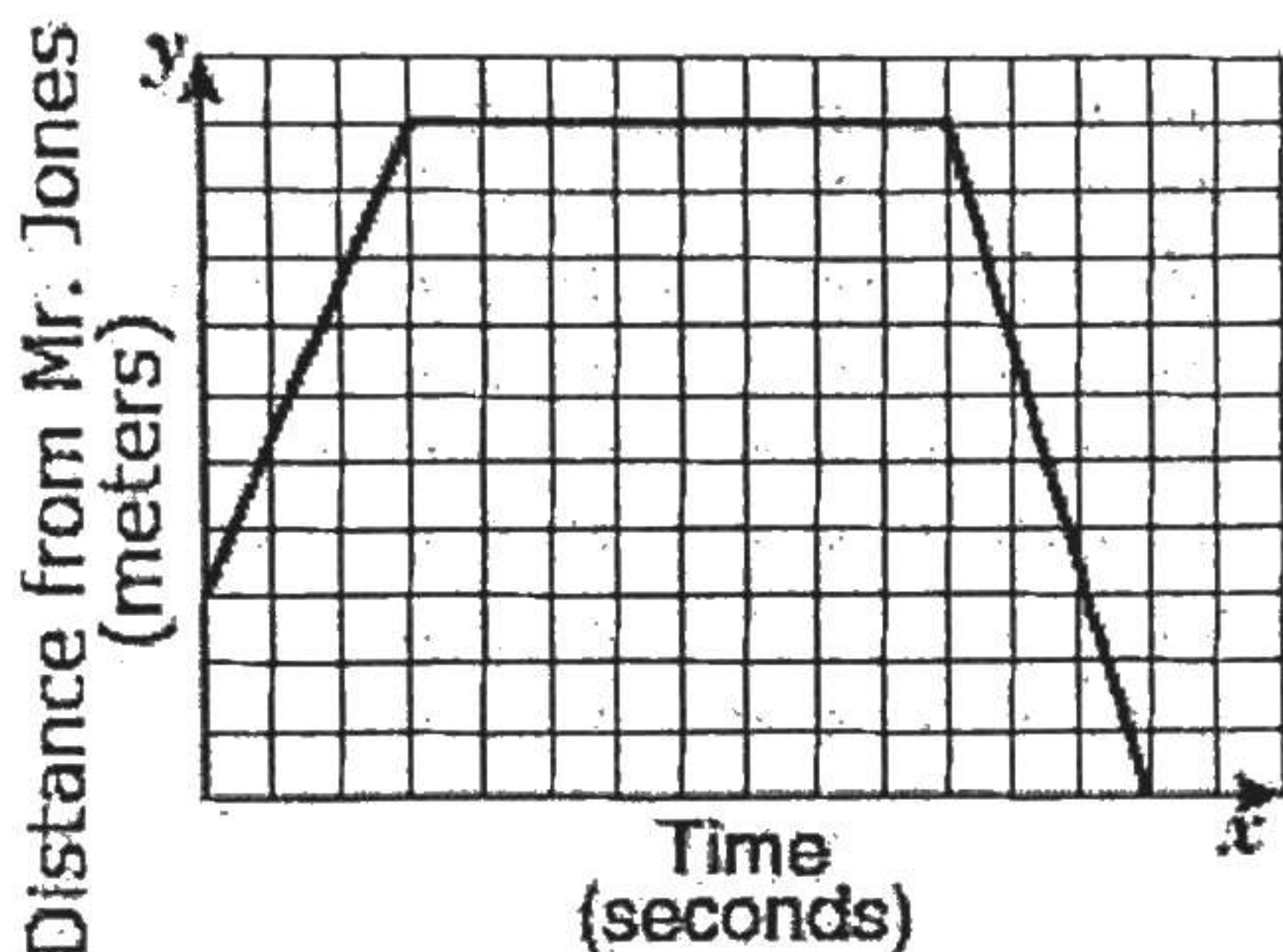
[B] There is one solution at $(2, 11)$

[C] There are no solutions

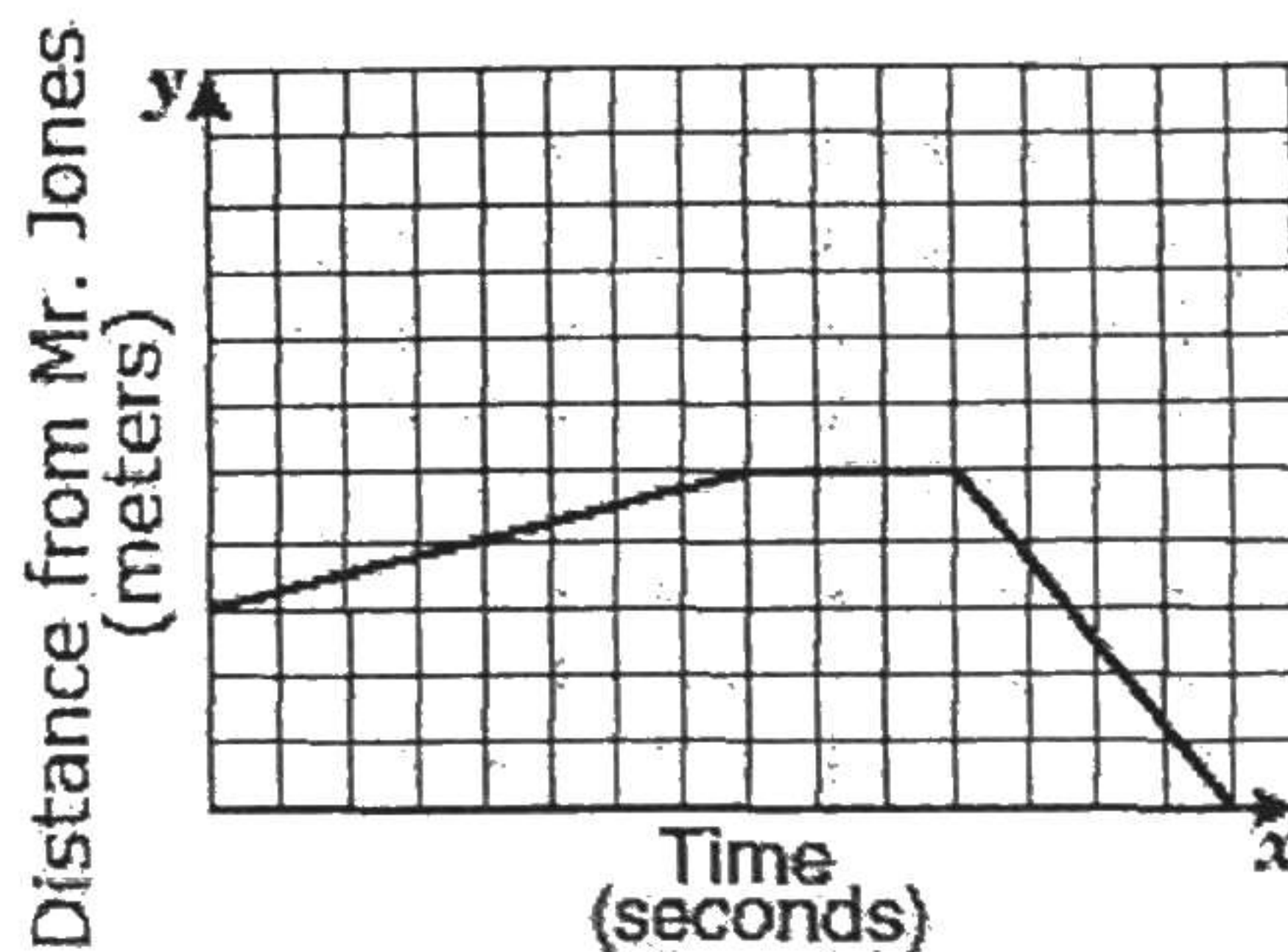
[D] There are infinitely many solutions

14) Mr. Jones asked his class to sketch a graph that would represent the following activity: "Start 3 meters away from me and quickly walk away from me for 3 seconds. Then stand still for 8 seconds and walk very quickly back reaching me in 3 seconds." Which graph best represents this activity?

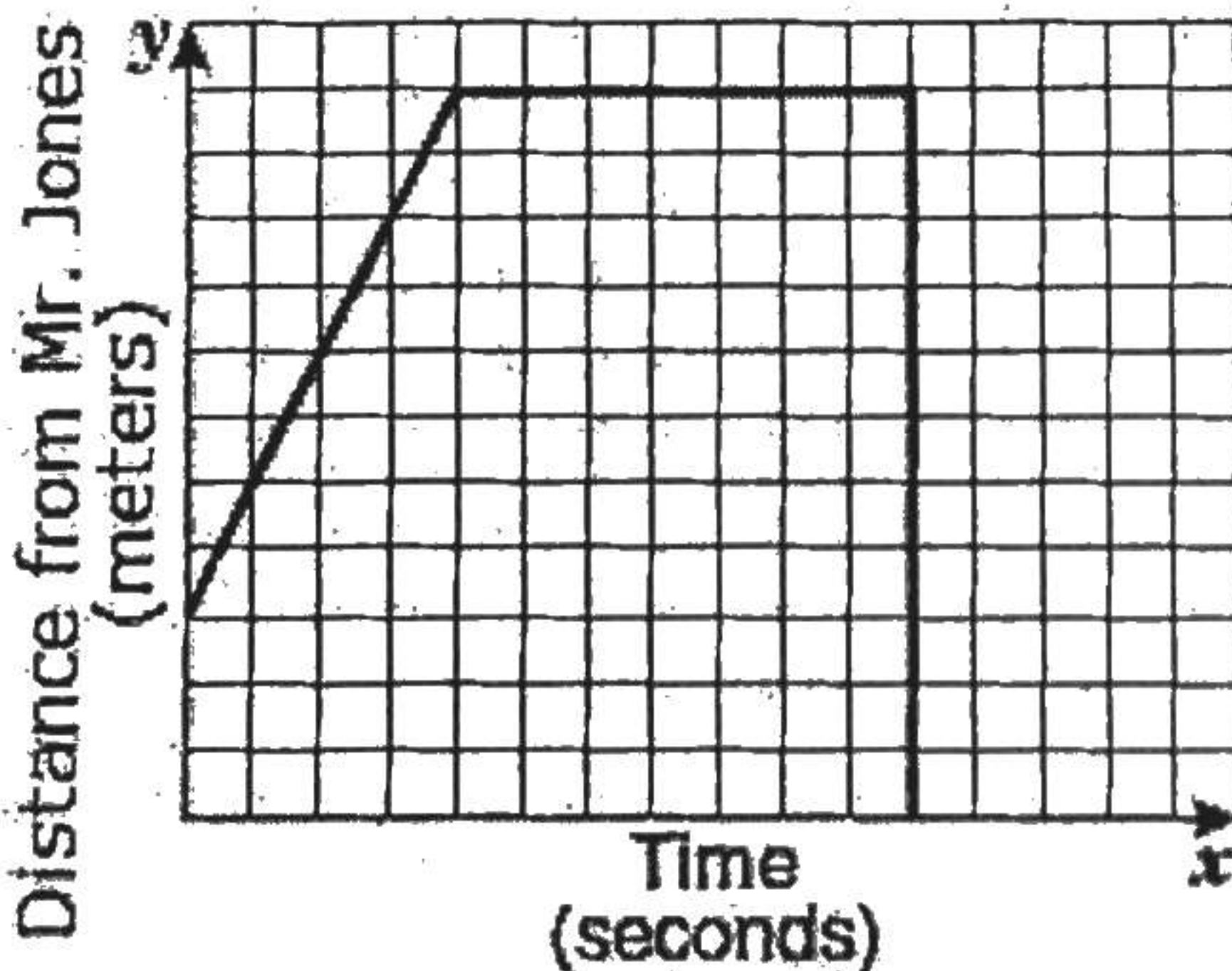
[A]



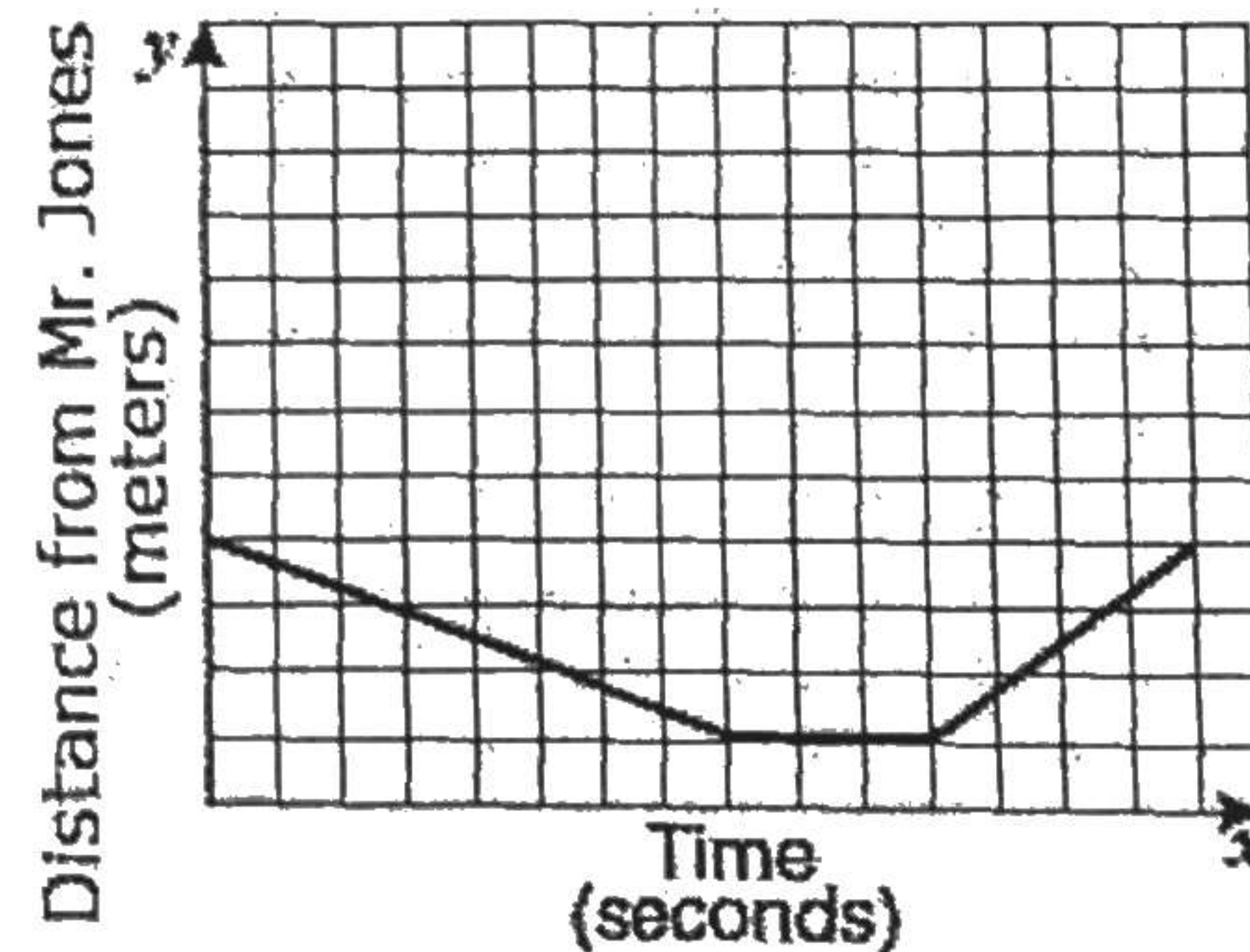
[B]



[C]



[D]



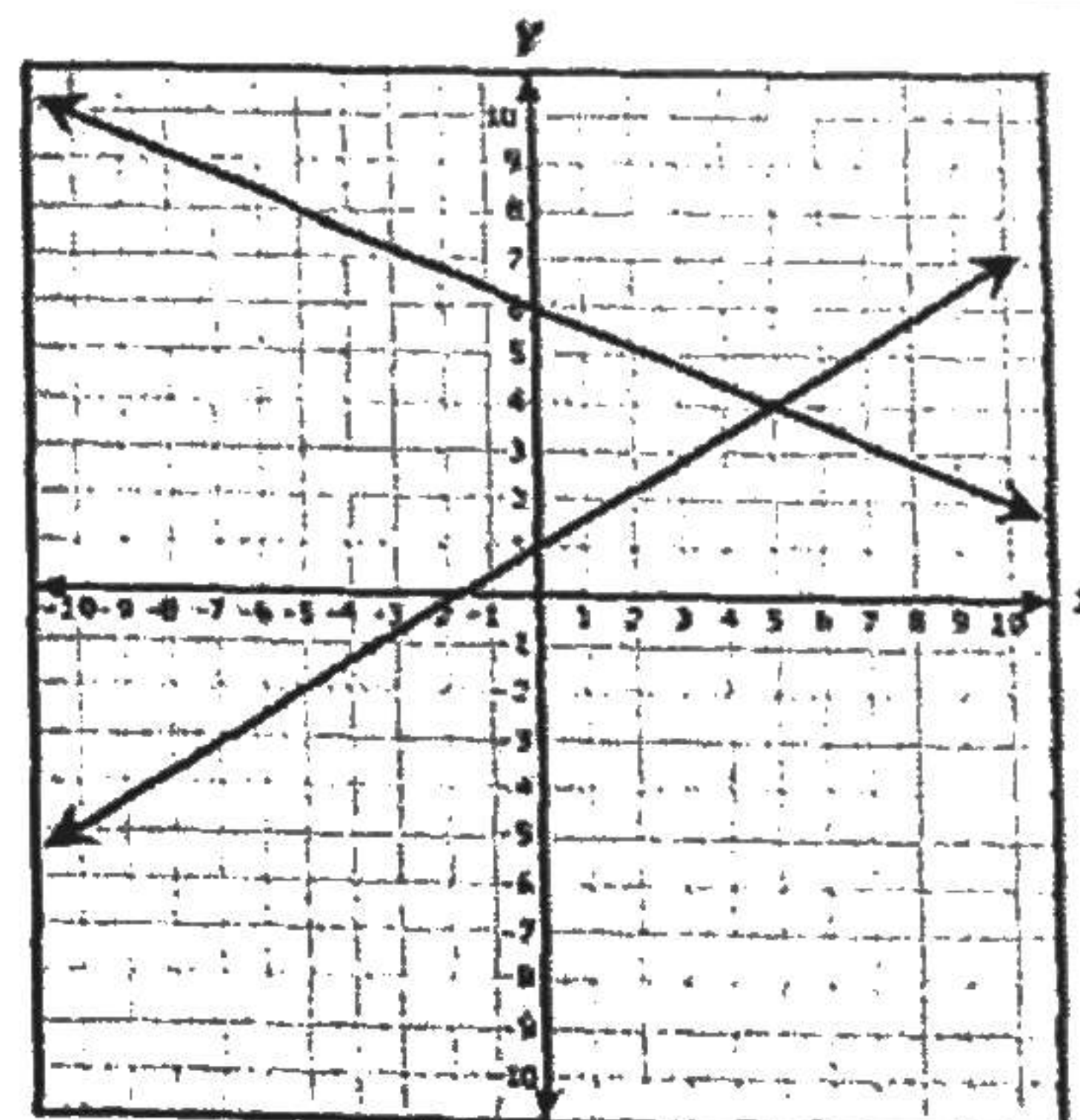
15) Which systems of linear equations best represents the graph shown here?

[A]
$$\begin{cases} 2x - 5y = 30 \\ 3x + 5y = -5 \end{cases}$$

[B]
$$\begin{cases} 2x + 5y = 30 \\ 3x - 5y = -5 \end{cases}$$

[C]
$$\begin{cases} 5x + 2y = 30 \\ 5x - 3y = -5 \end{cases}$$

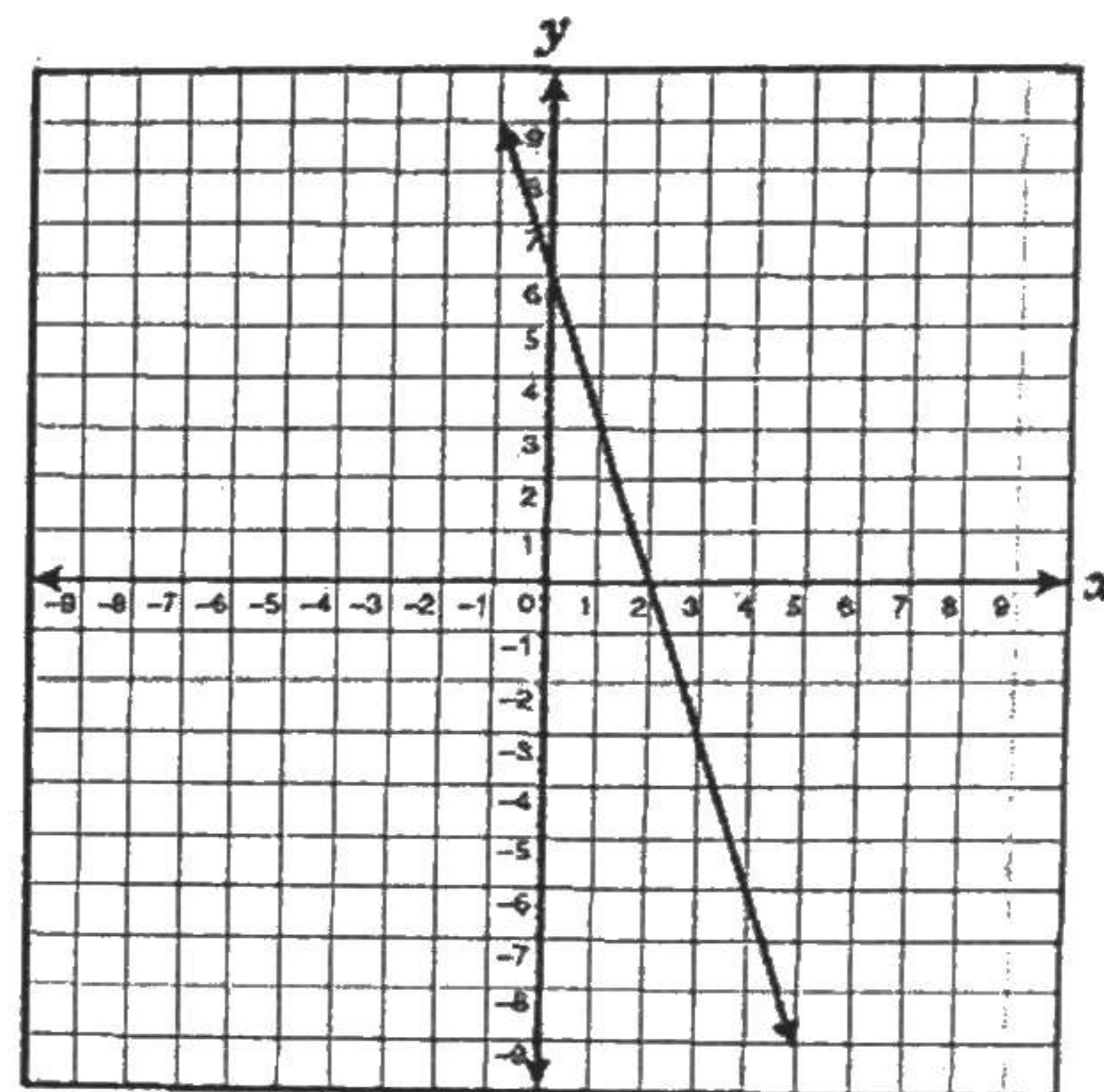
[D]
$$\begin{cases} 5x - 2y = 30 \\ 5x + 3y = -5 \end{cases}$$



16) What is the equation of the line shown here?

[A] $3x + y = 6$ [B] $x + 3y = 18$

[C] $x - 3y = -18$ [D] $3x - y = 6$



17) A certain video rental store rents video games for \$4.99 and DVDs for \$2.99. One day the store rented a total of 65 video games and DVDs. If the total rental income for this day was \$284.35, not including tax, which of the following statements is a reasonable conclusion?

[A] There were more video games than DVDs rented on this day.

[B] There were more DVDs than video games rented on this day.

[C] The total rental income for DVDs on this day was \$134.55, not including tax.

[D] The total rental income for video games on this day was \$99.80, not including tax.

18) Which of the following is NOT a correct description of the graph of the linear function $3x + y = -4$?

[A] The graph of the function contains the point $(-2, 2)$ and when the value of x increases by 1 unit, the value of y decreases by 3 units.

[B] The graph of the function contains the points $(-3, 5)$, $(2, -10)$, and $(5, -19)$.

[C] The graph of the function is a line that passes through the point $(0, -4)$ with a slope of -3 .

[D] The graph of the function contains the points $(0, -4)$, $(1, -7)$, and $(3, -1)$.

19) To rent a van, a store charges a fee of \$40 a day plus \$0.35 per mile driven. If the van is driven m miles in one day, the equation $t = .35m + 40$ can be used to find the total charges for a 1-day rental. If the store increases the rate per mile driven by \$0.15, which equation can be used to determine the new cost of renting a van for 1 day and driving m miles?

[A] $t = 0.20m + 40$

[B] $t = 0.50m + 40$

[C] $t = 0.20m + 55$

[D] $t = 0.50m + 55$