8.EE.8 Analyze and solve pairs of simultaneous linear equations

Amy needed to rent a car for a day so she researched two rental companies. Company A charges a flat rate of $25 plus $0.15 for every mile she drove the car. Company B charges a flat rate of $50 plus $0.05 for every mile she drove the car. If Amy had to drive a total of 370 miles, which rental car company would be a better deal and by how much?

A) Company A by $12
B) Company A by $80.50
C) Company B by $12
D) Company B by $68.50

What value of x satisfies the system of equations below?

$$x + y = 7$$
$$x + 2y = 5$$

A) 9
B) 6
C) 3
D) -2

Sophia has 8 books in her locker. All the books are either personal books or school books. She has three times as many school books as personal books. How many school books does Sophia have in her locker?

A) 2 B) 3 C) 6 D) 7

In a game, two players scored a total of 121 points. One player had 13 more points than the other player. How many points did the player with the fewer points score?

A) 52 B) 54 C) 67 D) 108

Three packaging companies use the expressions shown to calculate the cost, in dollars, for shipping an item weighing x pounds.

Company R: $\frac{3}{4}(2x + 7)$

Company S: $\frac{3}{2}(x + 1) + x$

Company T: $\frac{5}{2}(x + 2) + 1$

Part A: For what weight will the cost be the same for Company R and Company S? Show your work.

Part B: For what weight will the cost be the same for Company S and Company T? Show your work.

Part C: Which company has the highest rate? Explain your answer.

Part D: Avery says it is less expensive to ship an item using Company S than Company R. Is Avery correct? Explain your answer.

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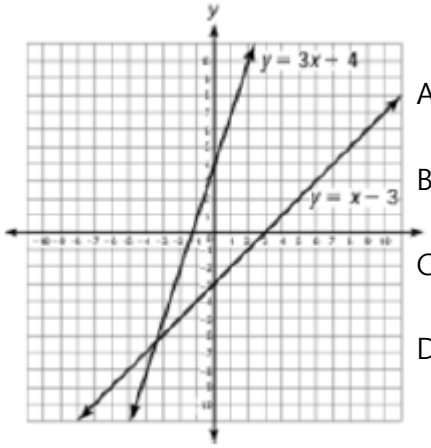
What is the solution to the system of linear equations graphed below?



A. (-3.5, -6.5)

B. (-3.5, 6.5)

C. (3.5, -6.5)

D. (3.5, 6.5)

Aidan earned a total of $117 in one week. His babysitting job pays him $15 per hour. His after-school job at a barber shop pays him $9 per hour. He worked a total of 9 hours that week. The system of linear equations below represents this situation, where x represents the number of hours Aidan spent babysitting and y represents the number of hours he worked at the barber shop.

$$x + y = 9$$
$$15x + 9y = 117$$

How many hours did Aidan work each job?

A. 3 hours babysitting, 6 hours at barber shop
B. 6 hours babysitting, 3 hours at barber shop
C. 9 hours babysitting, 15 hours at barber shop
D. 15 hours babysitting, 9 hours at barber shop

Ms. Prevost wrote a system of linear equations on the board and asked her students how many solutions it had.

$$y = 3x + 4$$
$$y = 3x + 7$$

Abby said it had no solution because the two lines are parallel and therefore cannot intersect. Ileana said it had no solution because 3x-y cannot equal both -4 and -7. Jun said there were infinitely many solutions because they are the same line. Who is correct?

A. Abby
B. Ileana
C. Jun
D. both Abby and Ileana

What is the solution to the following system of linear equations?

$$2x - 7y = 12$$
$$-2x + 6y = -10$$

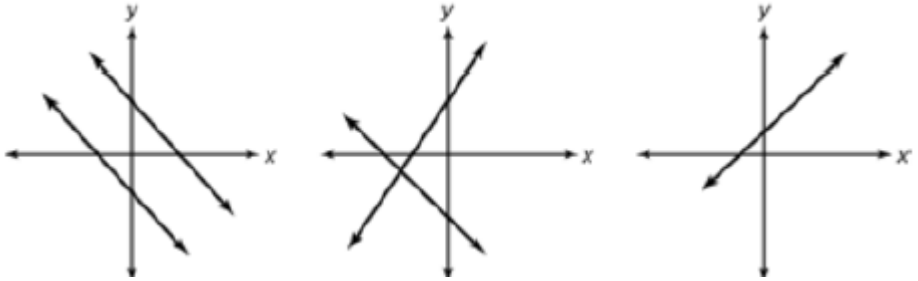
A. (1, 2)

B. (2, -1)

C. (-1, -2)

D. (-2, -1)

Graphs of three systems of linear equations are shown below.



Which of the following describes the number of solutions for each graph, from left to right?

A. no solution, infinitely many solutions, one solution
B. no solution, one solution, infinitely many solutions
C. infinitely many solutions, one solution, no solution
D. infinitely many solutions, no solution, one solution

Katharine and Janie are neighbors who are bicycling to a soccer game in their neighborhood. Janie leaves 6 minutes before Katharine and bicycles 10 miles per hour. When Katharine leaves, she bicycles 12 miles per hour. This situation is represented by the system of linear equations below.

$$y = 10x$$
$$y = 12(x - 0.1)$$

After how many hours will Katharine catch up to Janie?

A. 0.6 hours B. 1.2 hours C. 2.4 hours D. 6 hours