

Regents Review

Part I Questions

RR1. Which system of equations will yield the same result as the system below?

$$\begin{aligned}x - y &= 3 \\ 2x - 3y &= -1\end{aligned}$$

1) $\begin{aligned}-2x - 2y &= -6 \\ 2x - 3y &= -1\end{aligned}$

3) $\begin{aligned}-2x + 2y &= 3 \\ 2x - 3y &= -1\end{aligned}$

2) $\begin{aligned}2x - 2y &= 6 \\ 2x - 3y &= -1\end{aligned}$

4) $\begin{aligned}3x + 3y &= 9 \\ 2x - 3y &= -1\end{aligned}$

RR2. A system of equations is shown below.

Equation A: $5x + 9y = 12$

Equation B: $4x - 3y = 8$

$12x - 9y = 24$

Which method eliminates one of the variables?

- 1) Multiply Equation A by $-\frac{1}{3}$ and add the result to Equation B.
 2) Multiply Equation B by 3 and add the result to Equation A.
 3) Multiply Equation A by 2 and Equation B by -6 and add the results together.
 4) Multiply Equation B by 5 and Equation A by 4 and add the results together.

RR3. The equations $6x + 5y = 300$ and $3x + 7y = 285$ represent the money collected from selling gift baskets in a school fundraising event. If x represents the cost for each snack gift basket and y represents the cost for each chocolate gift basket, what is the cost for each chocolate gift basket?

$\begin{aligned}6x + 5y &= 300 \\ -2(3x + 7y) &= -2(285)\end{aligned} \rightarrow \begin{aligned}6x + 5y &= 300 \\ -6x - 14y &= -570\end{aligned} \rightarrow -9y = -270 \rightarrow y = 30$

1) \$20

2) \$25

3) \$30

4) \$54

RR4. Rowan has \$50 in a savings jar and is putting in \$5 every week. Jonah has \$10 in his own jar and is putting in \$15 every week. Each of them plots his progress on a graph with time on the horizontal axis and amount in the jar on the vertical axis. Which statement about their graphs is true?

- 1) Rowan's graph has a steeper slope than Jonah's.
 2) Rowan's graph always lies above Jonah's.
 3) Jonah's graph has a steeper slope than Rowan's.
 4) Jonah's graph always lies above Rowan's.

Rowan
 $y = 50 + 5x$
Jonah
 $y = 10 + 15x$

RR5. Lizzy has 30 coins that total \$4.80. All of her coins are dimes, D , and quarters, Q . Which system of equations models this situation?

1) $D + Q = 4.80$
 $.10D + .25Q = 30$

3) $D + Q = 30$
 $.25D + .10Q = 4.80$

2) $D + Q = 30$
 $.10D + .25Q = 4.80$

4) $D + Q = 4.80$
 $.25D + .10Q = 30$

RR6. During the 2010 season, football player McGee's earnings, m , were 0.005 million dollars more than those of his teammate Fitzpatrick's earnings, f . The two players earned a total of 3.95 million dollars. Which system of equations could be used to determine the amount each player earned, in millions of dollars?

1) $m + f = 3.95$
 $m + 0.005 = f$

3) $f - 3.95 = m$
 $m + 0.005 = f$

2) $m - 3.95 = f$
 $f + 0.005 = m$

4) $m + f = 3.95$
 $f + 0.005 = m$

RR7. The Celluloid Cinema sold 150 tickets to a movie. Some of these were child tickets and the rest were adult tickets. A child ticket cost \$7.75 and an adult ticket cost \$10.25. If the cinema sold \$1470 worth of tickets, which system of equations could be used to determine how many adult tickets, a , and how many child tickets, c , were sold?

1) $a + c = 150$
 $10.25a + 7.75c = 1470$

3) $a + c = 150$
 $7.75a + 10.25c = 1470$

2) $a + c = 1470$
 $10.25a + 7.75c = 150$

4) $a + c = 1470$
 $7.75a + 10.25c = 150$

RR8. Last week, a candle store received \$355.60 for selling 20 candles. Small candles sell for \$10.98 and large candles sell for \$27.98. How many large candles did the store sell?

1) 6

2) 8

3) 10

4) 12

RR9. Mo's farm stand sold a total of 165 pounds of apples and peaches. She sold apples for \$1.75 per pound and peaches for \$2.50 per pound. If she made \$337.50, how many pounds of peaches did she sell?

1) 11

2) 18

3) 65

4) 100

Open Response Questions

RR10. Guy and Jim work at a furniture store. Guy is paid \$185 per week plus 3% of his total sales in dollars, x , which can be represented by $g(x) = 185 + 0.03x$. Jim is paid \$275 per week plus 2.5% of his total sales in dollars, x , which can be represented by $f(x) = 275 + 0.025x$.

Determine the value of x , in dollars, that will make their weekly pay the same.

$$185 + 0.03x = 275 + 0.025x$$

$$185 + 0.005x = 275$$

$$0.005x = 90$$

$$x = 18000$$

\$18,000

RR11. In attempting to solve the system of equations $y = 3x - 2$ and $6x - 2y = 4$, John graphed the two equations on his graphing calculator. Because he saw only one line, John wrote that the answer to the system is the empty set. Is he correct? Explain your answer.

No, he is not correct because there are infinite solutions since both equations have the exact same solutions.

RR12. At Genesee High School, the sophomore class has 60 more students than the freshman class. The junior class has 50 fewer students than twice the students in the freshman class. The senior class is three times as large as the freshman class. If there are a total of 1,424 students at Genesee High School, how many students are in the freshman class?

$$\text{Sophomore} = F + 60$$

$$\text{Junior} = 2F - 50$$

$$\text{Senior} = 3F$$

$$F + (F + 60) + (2F - 50) + 3F = 1424$$

$$7F + 10 = 1424$$

$$7F = 1414$$

$$F = 202$$

202 students

RR13. Two friends went to a restaurant and ordered one plain pizza and two sodas. Their bill totaled \$15.95. Later that day, five friends went to the same restaurant. They ordered three plain pizzas and each person had one soda. Their bill totaled \$45.90.

Write and solve a system of equations to determine the price of one plain pizza.

$$\begin{aligned} -3(1p + 2s &= 15.95) \\ 3p + 5s &= 45.90 \end{aligned}$$

$$\begin{aligned} -3p - 6s &= -47.85 \\ 3p + 5s &= 45.90 \end{aligned}$$

$$-1s = -1.95$$

$$s = 1.95$$

$$1p + 2(1.95) = 15.95$$

$$1p + 3.90 = 15.95$$

$$p = 12.05$$

$$\boxed{1 \text{ pizza is } \$12.05}$$

RR14. For a class picnic, two teachers went to the same store to purchase drinks. One teacher purchased 18 juice boxes and 32 bottles of water, and spent \$19.92. The other teacher purchased 14 juice boxes and 26 bottles of water, and spent \$15.76.

Write a system of equations to represent the costs of a juice box, j , and a bottle of water, w .

$$\begin{aligned} 18j + 32w &= 19.92 \\ 14j + 26w &= 15.76 \end{aligned}$$

Kara said that the juice boxes might have cost 52 cents each and that the bottles of water might have cost 33 cents each. Use your system of equations to justify that Kara's prices are not possible.

$$\begin{aligned} 18(0.52) + 32(0.33) &= 19.92 \\ 9.36 + 10.56 &= 19.92 \\ 19.92 &= 19.92 \end{aligned}$$

✓

$$\begin{aligned} 14(0.52) + 26(0.33) &= 15.76 \\ 7.28 + 8.58 &= 15.76 \\ 15.86 &= 15.76 \end{aligned}$$

✗
Does not work!

Solve your system of equations to determine the actual cost, in dollars, of each juice box and each bottle of water.

$$\begin{aligned} 14(18j + 32w &= 19.92) \\ -18(14j + 26w &= 15.76) \\ \hline 252j + 448w &= 275.88 \\ -252j - 468w &= -283.68 \\ \hline -20w &= -4.80 \\ -20 & \quad -20 \\ \hline w &= 0.24 \end{aligned}$$

$$\begin{aligned} 18j + 32(0.24) &= 19.92 \\ 18j + 7.68 &= 19.92 \\ -7.68 & \quad -7.68 \\ \hline 18j &= 12.24 \\ 18 & \quad 18 \\ \hline j &= 0.68 \end{aligned}$$

RR15. An animal shelter spends \$2.35 per day to care for each cat and \$5.50 per day to care for each dog. Pat noticed that the shelter spent \$89.50 caring for cats and dogs on Wednesday.

Write an equation to represent the possible numbers of cats and dogs that could have been at the shelter on Wednesday.

$$2.35c + 5.50d = 89.50$$

Pat said that there might have been 8 cats and 14 dogs at the shelter on Wednesday. Are Pat's numbers possible? Use your equation to justify your answer.

$$\begin{aligned} 2.35(8) + 5.50(14) &= 89.50 \\ 18.80 + 77 &= 89.50 \\ 95.80 &\neq 89.50 \\ &\text{NOT possible} \end{aligned}$$

Later, Pat found a record showing that there were a total of 22 cats and dogs at the shelter on Wednesday. How many cats were at the shelter on Wednesday?

10 cats

$$\begin{array}{r} 2.35c + 5.50d = 89.50 \\ -5.5(c + d = 22) \\ \hline -3.15c = -31.50 \\ c = 10 \end{array}$$

RR16. There are two parking garages in Beacon Falls. Garage A charges \$7.00 to park for the first 2 hours, and each additional hour costs \$3.00. Garage B charges \$3.25 per hour to park. When a person parks for at least 2 hours, write equations to model the cost of parking for a total of x hours in Garage A and Garage B.

Determine algebraically the number of hours when the cost of parking at both garages will be the same

$$A = 7 + 3(x - 2)$$

$$B = 3.25x$$

$$7 + 3(x - 2) = 3.25x$$

$$7 + 3x - 6 = 3.25x$$

$$\begin{array}{r} -3x \qquad -3x \\ \hline 1 = 0.25x \\ \frac{1}{0.25} = \frac{0.25x}{0.25} \end{array}$$

$$\frac{1}{0.25} = \frac{0.25x}{0.25}$$

$$4 = x$$

4 hours

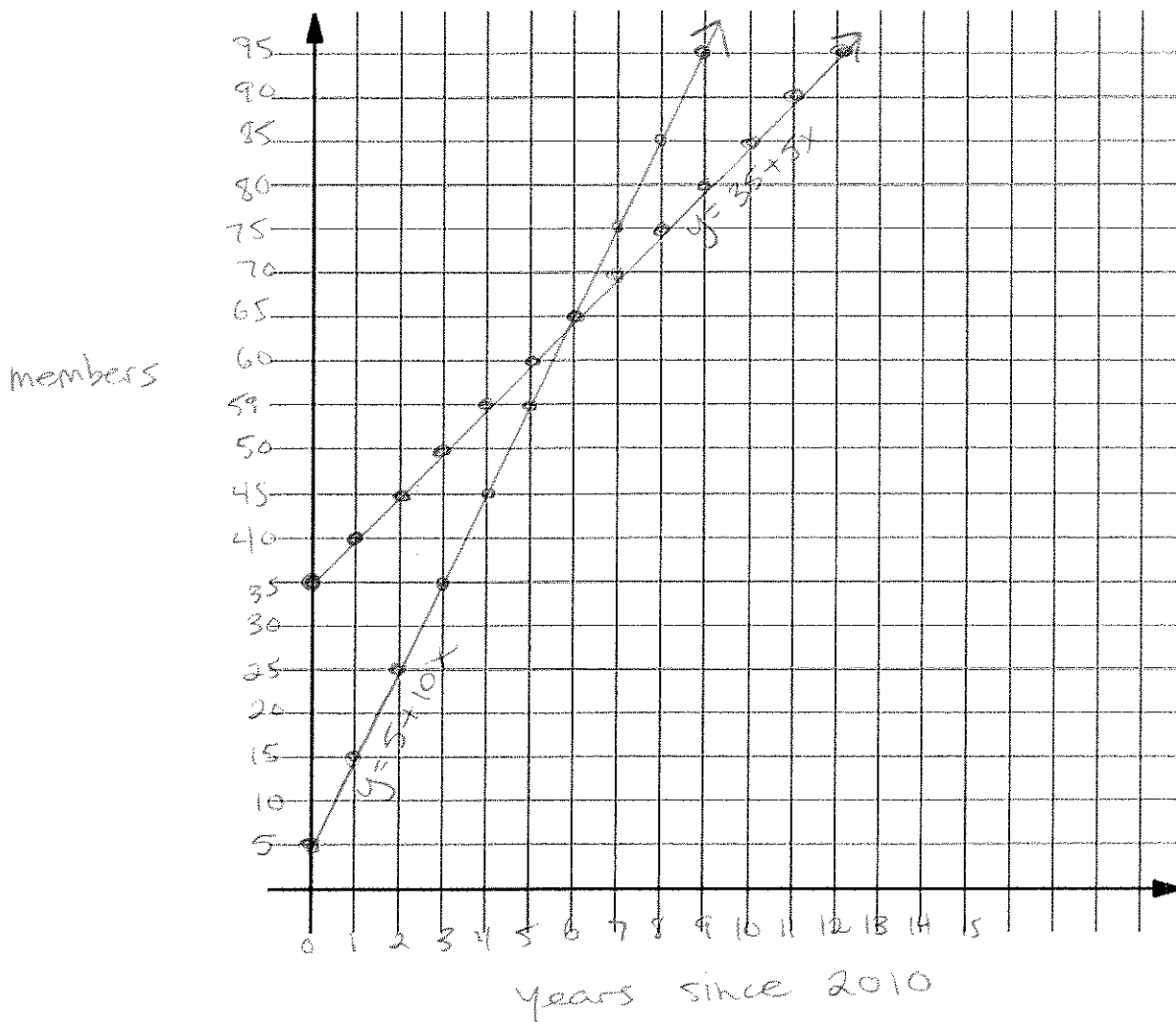
RR17. Central High School had five members on their swim team in 2010. Over the next several years, the team increased by an average of 10 members per year. The same school had 35 members in their chorus in 2010. The chorus saw an increase of 5 members per year.

Write a system of equations to model this situation, where x represents the number of years since 2010.

$$y = 5 + 10x$$

$$y = 35 + 5x$$

Graph this system of equations on the set of axes below.



Explain in detail what each coordinate of the point of intersection of these equations means in the context of this problem.

$(6, 65)$ 6 years after 2010, both the swim team and chorus will have 65 members