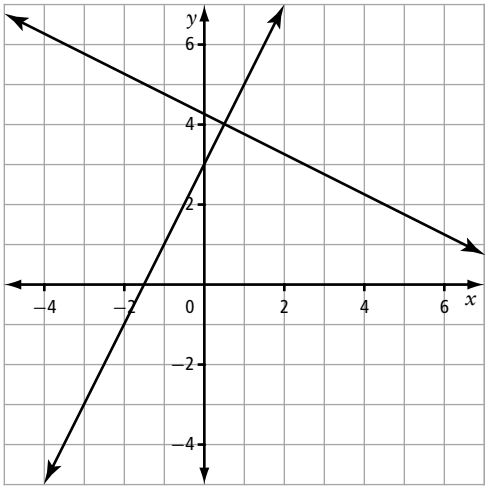
Multiple Choice

For #1 to #16, choose the best answer.

1. Which ordered pair represents the solution to the system of linear equations?



A $\left(\frac{1}{2}, 4\right)$

B $\left(\frac{5}{2}, 3\right)$

C $\left(-1\frac{1}{2}, 0\right)$

D (0, 3)

2. The solution to the linear system given by $3x - 5y = 10$ and $2x + 3y = 12$, rounded to the nearest tenth, is

A (4, 1)

B (4.7, 0.8)

C (30, −16)

D (4.7, −0.8)

3. The solution to the linear system represented by $4x - 3y + 12 = 0$ and $2x + 5y - 20 = 0$ is

A the y-intercepts of the graphs

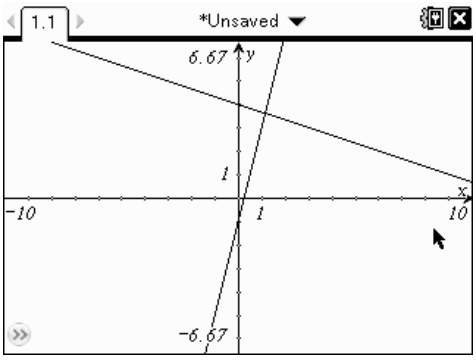
B the x-intercepts of the graphs

C the point (10, −3)

D the point (4, 0)

4. Which graph shows the solution to the system of linear equations represented by $y = -\frac{1}{3}x + 4$ and $y = 4x - 1$?

A



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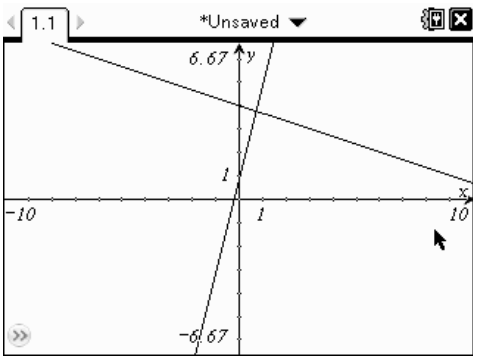

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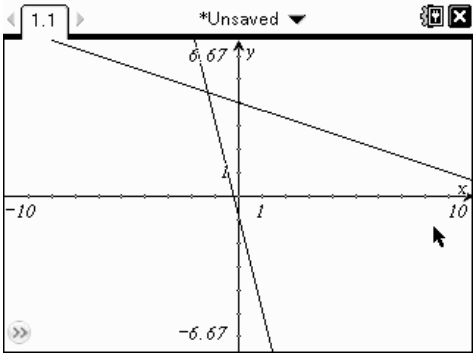

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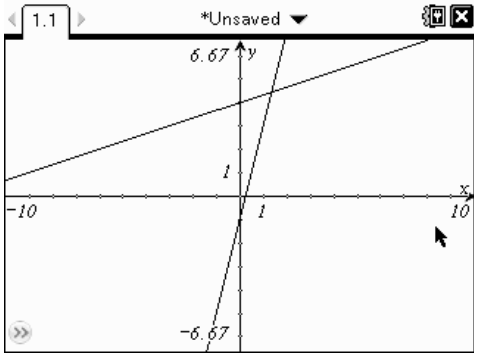


5. The Math department is selling school supplies to raise money to buy new calculators for students. Pencils are \$2 each and pads of sticky notes are \$5 each. Suppose that 500 items are sold and \$1870 is raised. Which system of linear equations can be used to determine the number of pencils, p, and the number of note pads, g, that were sold?

A $p + g = 500$
$p + g = 1870$

B $p + g = 500$
$2p + 5g = 1870$

C $2p + 5g = 500$
$p + g = 1870$

D $2p + 5g = 500$
$2p + 5g = 1870$

6. How many solutions are there for the system of linear equations $2x - y = 12$ and $4x + 20 = 2y$?

A zero

B one

C two

D an infinite number

7. Janine wants to solve the following system of linear equations algebraically.

$$5x + 3y = 21$$
$$3x - 5y = 15$$

Which calculation is a possible process to determine the correct solution?

A Multiply both equations by 3. Then, subtract the equations.

B Multiply the top equation by 5 and the bottom equation by 3. Then, subtract the equations.

C Multiply the top equation by 5 and the bottom equation by 3. Then, add the equations.

D Multiply the top equation by 3 and the bottom equation by 5. Then, add the equations.

8. For which system is (1, 0) a solution?

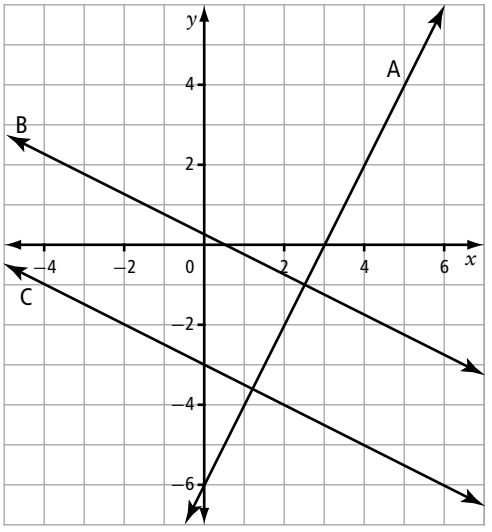
A $6x + y = -1$
$2x + y = 2$

B $x - y = -1$
$x + y = 1$

C $4x + 3y = 4$
$2x - 5y = 2$

D $3x - y = 10$
$5x + 3y = 2$

9. The graph of three lines is shown.



Which pair of lines represents a system of equations with no solution?

A A and C

B A and B

C B and C

D all pairs have a solution

10. The Manitoba Children's Museum is located at The Forks, in the heart of downtown Winnipeg. Two seniors and five children would pay \$47.50 for admission. Three children and one senior would pay \$27.25 for tickets. Which statement about admission prices is true?

A A child's ticket costs \$6.25.

B A senior's ticket costs \$6.25.

C A senior's ticket costs \$6.80.

D A child's ticket costs \$6.82.

11. Amanda has \$50 and earns \$10 per hour. John has \$30 and earns \$15 per hour. Amanda creates a system of linear equations to model the amounts of money they each could earn. When she graphs the lines, Amanda determines the point of intersection to be (4, 90). Which conclusion about the point of intersection is true?

A Amanda will always have more money than John.

B John will always have more money than Amanda.

C Amanda and John will make the same amount of money after working 90 hours.

D If Amanda and John both work 4 hours, they will have the same amount of money.

12. Taylor wants to use substitution to solve the system of linear equations $5x - y - 12 = 0$ and $x - 4y + 9 = 0$. Which equation is a possible first step to determining the correct solution?

A $y = -5x + 12$

B $y = 5x + 12$

C $x = 4y - 9$

D $x = 4y + 9$

13. The solution to the system of linear equations represented by $12x - 6y = -11$ and $6x + 18y = 47$ is

A $\left(-\frac{1}{3}, \frac{49}{18}\right)$

B $\left(-\frac{19}{60}, \frac{6}{5}\right)$

C $\left(\frac{1}{3}, \frac{5}{2}\right)$

D $\left(\frac{46}{3}, -\frac{5}{2}\right)$

14. Melody is trying to solve the following system of linear equations by using substitution.

$$4x - y - 18 = 0$$
$$x + 2y - 9 = 0$$

Her partial solution is as follows.

Step 1: $4x - y - 18 = 0$
$2y - 9 = x$
Step 2: $4(2y - 9) - y - 18 = 0$
Step 3: $8y - 9 - y = 18$
Step 4: $y = \frac{27}{7}$

In which step did Melody make her first error?

A Step 1

B Step 2

C Step 3

D Step 4

15. The Environment Club in your school held a recycling drive to raise money. The club collected a total of 1965 1-L and 2-L milk containers and raised \$456.15. If the refund is 10 cents for a 1-L container and 25 cents for a 2-L container, how many containers of each type did the students collect?

A 324 1-L containers, 128 2-L containers

B 124 1-L containers, 128 2-L containers

C 1731 1-L containers, 234 2-L containers

D 234 1-L containers, 1731 2-L containers

16. Which one of the following systems is *not* a system of linear equations?

A $x = -y + 2$
$2x + y = 0$

B $x + y = 10$
$2x + 2y = 20$

C $3x + y = 11$
$3x + y = 10$

D $x^2 + y = 10$
$2x - y = 6$

Numerical Response

17. Frank is 3 years older than twice Dolores's age. If the sum of their ages is 51, how old is Dolores?

18. What is the x-coordinate of the solution to the linear system represented by $x - 4y = 13$ and $x + y - 18 = 0$?

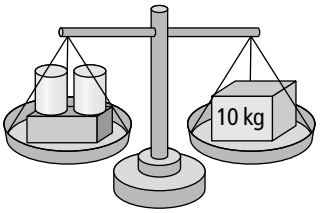
19. Cody has \$2.20 in dimes and quarters. If Cody has 13 coins in total, how many dimes does he have?

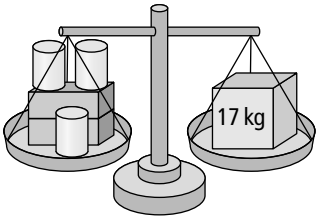
20. If the system of linear equations represented by $4x + 3y = 7$ and $12x + ky = 21$ has an infinite number of solutions, what is the value of k?

21. Joseph wants to solve the system of linear equations $6x + 5y = -28$ and $x + y = 11$ by elimination. By what value could he multiply the second equation and then subtract the two equations to eliminate the y-variable?

Extended Response

22. The diagrams represent a system of linear equations.





a) Write the system of linear equations that the diagrams model.

b) Algebraically determine the mass of each cylinder and rectangular block.

23. Determine the exact values for the solutions to each linear system.

a) $\frac{2}{3}x + \frac{3}{2}y = -1$
$\frac{1}{4}x - y = \frac{1}{2}$

b) $2x - y = -\frac{1}{10}$
$-x + \frac{2}{5}y = 1$

24. The Steier family drove 880 km in 10 hours to attend a family reunion. On the highway, they drove at an average speed of 100 km/h. In the city, their average speed was 60 km/h. If x represents the time spent on the highway and y represents the driving time in the city, the situation could be modelled by the linear system $x + y = 10$ and $100x + 60y = 880$.

a) Which algebraic method would you choose to solve the system? Explain your reasoning.

b) Solve the linear system to determine how many hours the family drove on the highway and how many hours they drove in the city.

c) Verify your solution to the linear system by graphing.

25. In geometry, two angles are supplementary if their sum is 180°. Eric measures two supplementary angles and concludes that one angle is 12° less than three times the other angle.

a) Write a system of linear equations involving two variables that could be used to determine the measures of the two angles.

b) Which algebraic method would you choose to solve the system? Explain your reasoning.

c) Solve the linear system to determine the measures of the two angles.

26. The points (5, 2) and (2, −7) lie on the line $Ax - By = 13$. Algebraically determine the values of A and B.