# Math 10C: Systems of Equations
PRACTICE EXAM

1. An online music store offers two payment methods:

> **1)** The customer pays a monthly subscription fee of $8.00 and songs can be downloaded for $0.70 each.
> **2)** The customer pays as they go, at the full rate of $0.90/song.

The two payment methods can be represented with the system of equations:

A. $C = 0.70n + 8$ and $C = 0.90n$

B. $C = -0.70n + 8$ and $C = -0.90n$

C. $C = 0.70n - 8$ and $C = 0.90n$

D. $C = 8n + 0.70$ and $C = 0.90n$

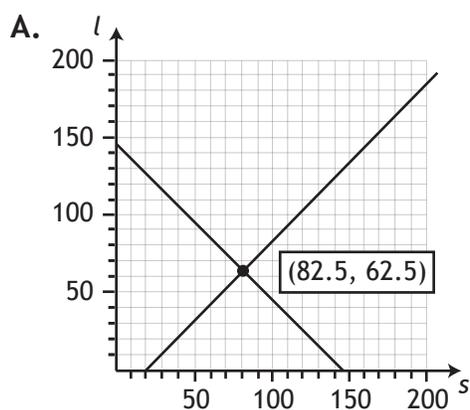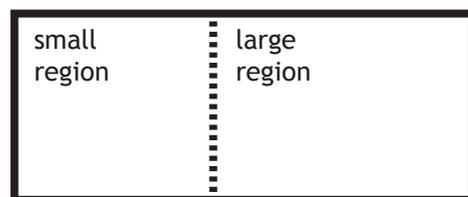2. The system of equations $y = -\dfrac{3}{4}x + 1$ and $y = \dfrac{7}{4}x - 9$ has the point of intersection:

A.

(-4, -2)

B.

(4, -2)

C.

(5, -6)

D.

(8, 5)
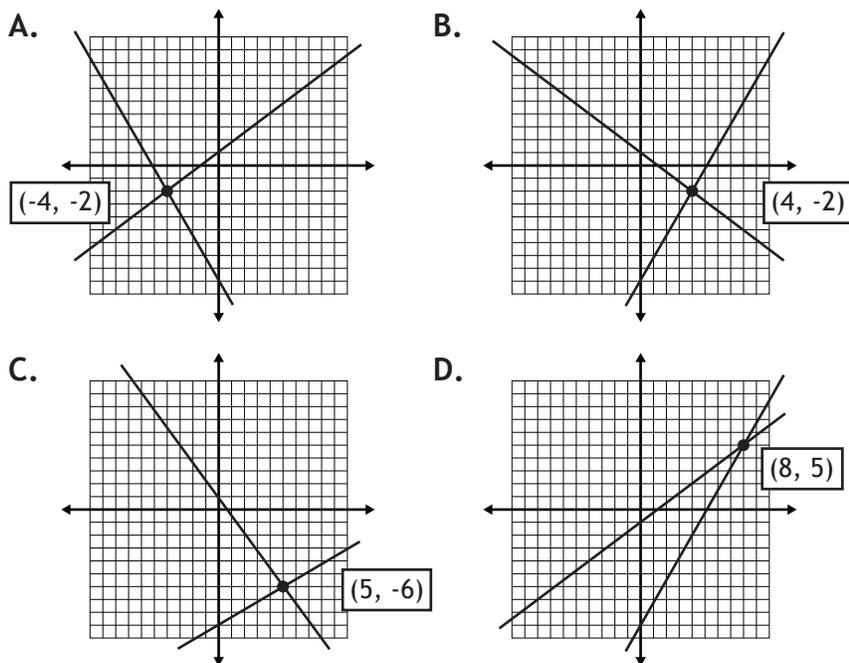
3. The system of equations $4x - 7y + 35 = 0$ and $5x + 7y + 28 = 0$ can be graphed using:

A. $y = -\dfrac{4}{7}x - 5$ and $y = \dfrac{5}{7}x + 4$

B. $y = \dfrac{4}{7}x + 5$ and $y = -\dfrac{5}{7}x - 4$

C. $y = \dfrac{5}{7}x + 4$ and $y = -\dfrac{4}{7}x - 5$

D. $y = \dfrac{7}{4}x + 5$ and $y = -\dfrac{7}{5}x - 4$

4. The system of equations $y = -\dfrac{1}{3}x + 6$ and $2x + 6y = 24$ has:

A. No solution, because the slopes are identical and the y-intercepts are the same.

B. No solution, because the slopes are identical and the y-intercepts are different.

C. One solution, because the slopes are different.

D. Infinite solutions, because the slopes are identical and the y-intercepts are the same.

5. The system of equations $3x + 9y = -9$ and $x + 3y = -3$ has:

A. No solution, because the slopes are identical and the y-intercepts are the same.

B. No solution, because the slopes are identical and the y-intercepts are different.

C. One solution, because the slopes are different.

**D.** Infinite solutions, because the slopes are identical and the y-intercepts are the same.

6. A rectangular lot is separated by a fence. The large region has an area 20 m² greater than the small region. The total area of the lot is 145 m². The graphical solution to this problem, where *s* is the area of the small lot and *l* is the area of the large lot, is shown in:
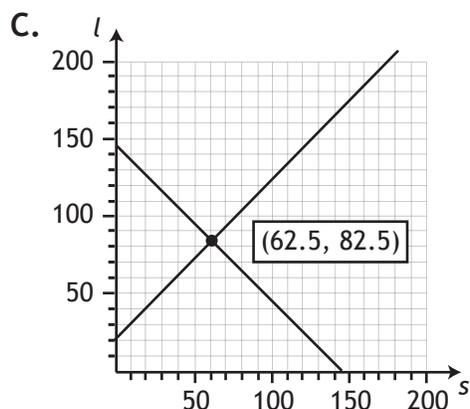
| small region | large region |

A.

$l = -s + 145$
$l = s - 20$

Area of small lot = 82.5 m²

Area of large lot = 62.5 m²

(82.5, 62.5)

B.
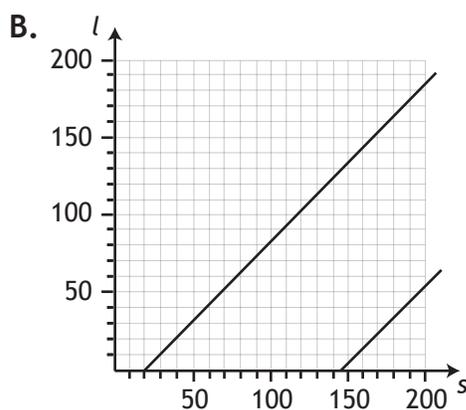
$l = s - 145$
$l = s - 20$

Parallel lines. No solution.

C.

$l = -s + 145$
$l = s + 20$

Area of small lot = 82.5 m²

Area of large lot = 62.5 m²

(62.5, 82.5)

D.
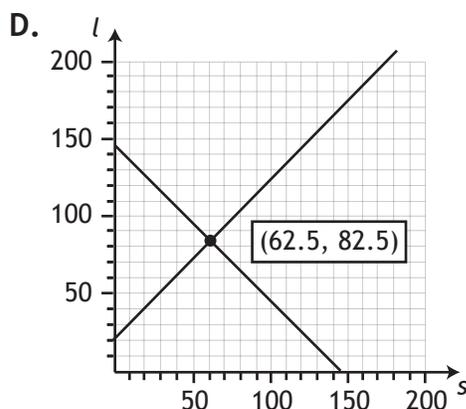
$l = -s + 145$
$l = s + 20$

Area of small lot = 62.5 m²

Area of large lot = 82.5 m²

(62.5, 82.5)

7. In an apartment building, one elevator rises from the 14th floor to the 24th floor in 20 seconds. During that same time, another elevator descends from the 32nd floor to the 12th floor. The graphical solution to this problem, where t is the elapsed time and f is the floor number, is shown in:

A.

$f = 2t + 14$
$f = -0.5t + 32$

(7.2, 28.4)
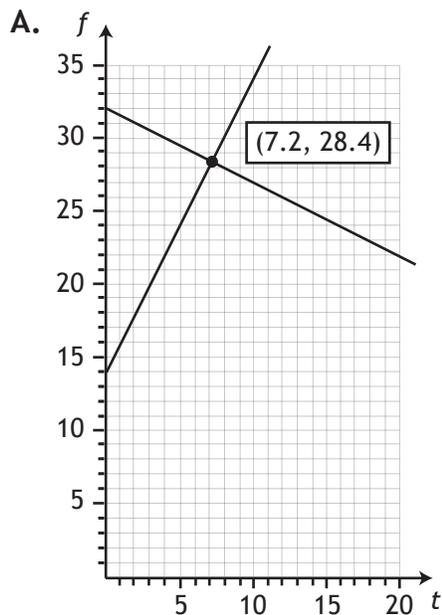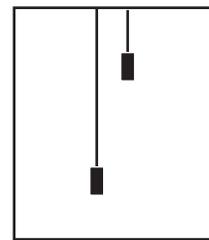
The elevators pass at 7.2 seconds between the 28th and 29th floors.

B.

$f = 0.5t + 14$
$f = -t + 32$

(12, 20)
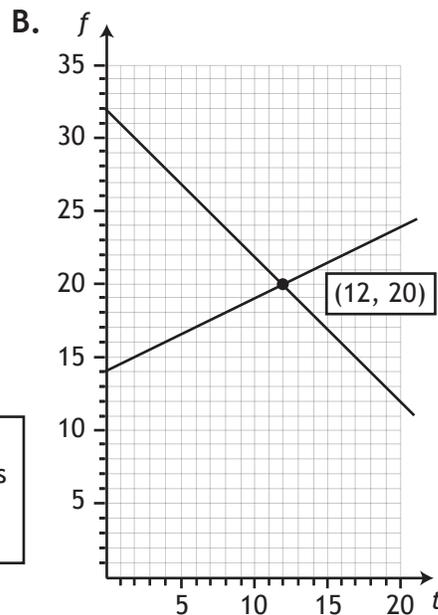
The elevators pass at 12 seconds on the 20th floor.

C.
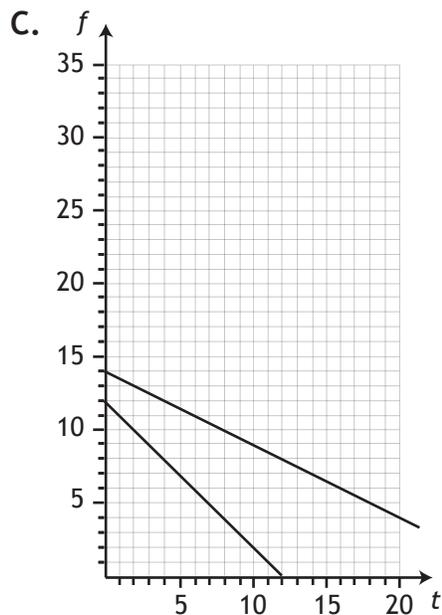
$f = -0.5t + 14$
$f = -t + 12$

The elevators pass at a negative time, so there is no solution.

D.

$f = 0.5t + 14$
$f = t + 12$

(4, 16)
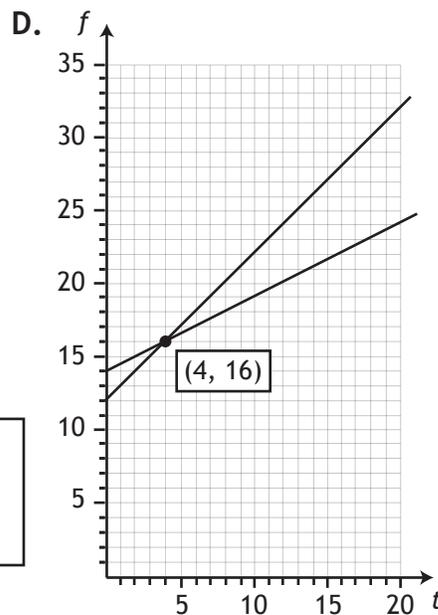
The elevators pass at 4 seconds on the 16th floor.

8. Using substitution, the solution to the system of equations $x + 3y = 9$ and $4x - y = 10$ is:

A. (-5, 1)

B. (0, 3)

C. (3, 2)

D. (4, -1)

Use the following information to answer questions 9, 10, 11 and 18, 19, 20.

Independent Systems ⟋
Systems that yield a definite result, such as x = -5 and y = -4, are called *independent systems*.
The equations of an independent system yield intersecting lines and have one solution.

Indeterminate Systems ╱	**Inconsistent Systems** ╱╱
Systems that yield an equality, such as 0 = 0 or 2 = 2, are called *indeterminate systems*.	Systems that yield a false result, such as 0 = 12, are called *inconsistent systems*.
The equations of an indeterminate system yield identical lines and have infinite solutions.	The equations of an inconsistent system yield parallel lines and have no solution.

9. The system of equations $x + 6y = -29$ and $x + \dfrac{1}{4}y = -6$ has:

> *Solve with substitution.*

A. No solution, because the system is independent.

B. No solution, because the system is inconsistent.

C. One solution, because the system is independent.

D. Infinite solutions, because the system is indeterminate.

10. The system of equations $x + 3y = 3$ and $3x + 9y = 9$ has:

A. No solution, because the system is independent.

B. No solution, because the system is inconsistent.

C. One solution, because the system is independent.

D. Infinite solutions, because the system is indeterminate.

11. The system of equations $2x - y = -13$ and $2x - y = -1$ has:

A. No solution, because the system is independent.

B. No solution, because the system is inconsistent.

C. One solution, because the system is independent.

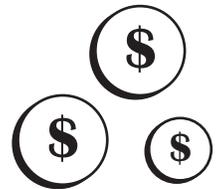D. Infinite solutions, because the system is indeterminate.

12. Katrina has $2.50 worth of nickels and dimes. She has 36 coins in total. How many nickels and dimes does she have? Solve using substitution.

A. 12 dimes and 24 nickels

B. 13 dimes and 23 nickels

C. 14 dimes and 22 nickels

D. 15 dimes and 21 nickels

13. Kory drives from Edmonton to Lloydminster and back. Going to Lloydminster, he drives with an average speed of 96 km/h. For the return trip, he averages a speed of 100 km/h. The total time driving is 5.1 hours. Using this information, calculate the distance from Edmonton to Lloydminster. Solve using substitution.

A. 200 km

B. 250 km

C. 300 km

D. 350 km

14. James invests a total of $5000 in two different investments. The first investment earns 2.9% interest, and the second investment earns 4.5% interest. The total interest earned is $196.20. How much did James invest in each investment? Solve using substitution.

A. $1800 in the low-yield investment and $3200 in the high-yield investment.

B. $1900 in the low-yield investment and $3150 in the high-yield investment.

C. $2000 in the low-yield investment and $3100 in the high-yield investment.

D. $2100 in the low-yield investment and $3050 in the high-yield investment.

15. One bin of dried fruit mix contains 28% apricots. A different bin of dried fruit mix contains 18% apricots. A new mix is made using one scoop from each bin. This mix has a mass of 600 g, and contains 25% apricots. What was the mass of dried fruit in each scoop? Solve using substitution.

A. The scoop from the first bin was 420 g, and the scoop from the second bin was 180 g.

B. The scoop from the first bin was 430 g, and the scoop from the second bin was 175 g.

C. The scoop from the first bin was 440 g, and the scoop from the second bin was 170 g.

D. The scoop from the first bin was 450 g, and the scoop from the second bin was 165 g.

16. The system of equations $x + 2y = 0$ and $x + 5y = b$ has the solution $(-2, a)$. Determine the values of a and b.

A. $a = 1$ and $b = 3$

B. $a = 2$ and $b = 2$

C. $a = 2$ and $b = 3$

D. $a = 3$ and $b = 1$

17. Using elimination, the solution to the system of equations $2x - y = 8$ and $5x - 3y = 21$ is:

A. (-1, 1)

B. (0, -3)

C. (3, -2)

D. (4, 0)

18. The system of equations $x - \dfrac{1}{2}y = -3$ and $\dfrac{1}{2}x + y = -4$ has: | *Solve with elimination.*

A. No solution, because the system is independent.

B. No solution, because the system is inconsistent.

C. One solution, because the system is independent.

D. Infinite solutions, because the system is indeterminate.

19. The system of equations $6x + 4y = 14$ and $x + \dfrac{2}{3}y = \dfrac{7}{3}$ has:

    A. No solution, because the system is independent.

    B. No solution, because the system is inconsistent.

    C. One solution, because the system is independent.

    D. Infinite solutions, because the system is indeterminate.

20. The system of equations $x - \dfrac{1}{2}y = 4$ and $2x - y = 5$ has:

    A. No solution, because the system is independent.

    B. No solution, because the system is inconsistent.

    C. One solution, because the system is independent.

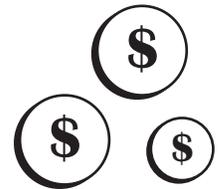   **D.** Infinite solutions, because the system is indeterminate.

21. A coin collection has 33 quarters and nickels. The number of nickels is 5 greater than three times the number of quarters. How many coins of each type are there? Solve using elimination.

    A. 26 nickels and 7 quarters.

    B. 25 nickels and 8 quarters.

    C. 24 nickels and 9 quarters.

    D. 23 nickels and 10 quarters.

22. It takes 3 hours for a canoe to travel 45 km downstream. The return trip, going upstream, takes 5 hours. What is the speed of the canoe and the speed of the current? Solve using elimination.

    A. The speed of the canoe is 4 km/h, and the speed of the current is 4 km/h.

    B. The speed of the canoe is 8 km/h, and the speed of the current is 3.5 km/h.

    C. The speed of the canoe is 12 km/h, and the speed of the current is 3 km/h.

    D. The speed of the canoe is 16 km/h, and the speed of the current is 5 km/h.

23. Corrine's mom is 25 years older than Corrine. In two years, Corrine's mom will be twice Corrine's age. How old are Corrine and Corrine's mom? Solve using elimination.

A. Corrine is 22 and her mom is 47.

B. Corrine is 23 and her mom is 48.

C. Corrine is 24 and her mom is 49.

D. Corrine is 25 and her mom is 50.

24. Ryan and Greg split the driving on a 1335 km trip from Calgary to Winnipeg. Ryan drove to Regina with an average speed of 90 km/h. Greg drove the rest of the way to Winnipeg with an average speed of 100 km/h. The total trip took 14.2 hours. What is the distance between Calgary and Regina? Regina and Winnipeg? Solve using elimination.

A. Calgary to Regina is 570 km, and Regina to Winnipeg is 765 km.

B. Calgary to Regina is 765 km, and Regina to Winnipeg is 570 km.

C. Calgary to Regina is 665 km, and Regina to Winnipeg is 670 km.

D. Calgary to Regina is 670 km, and Regina to Winnipeg is 665 km.

Systems of Equations - ANSWER KEY
Video solutions are in italics.

1. **A** *Solving Systems Graphically, Introduction*

2. **B** *Solving Systems Graphically, Example 1a*

3. **B** *Solving Systems Graphically, Example 1b*

4. **B** *Solving Systems Graphically, Example 2c*

5. **D** *Solving Systems Graphically, Example 3b*

6. **D** *Solving Systems Graphically, Example 6*

7. **B** *Solving Systems Graphically, Example 8*

8. **C** *Substitution, Example 1b*

9. **C** *Substitution, Example 2b*

10. **D** *Substitution, Example 2c*

11. **B** *Substitution, Example 2d*

12. **C** *Substitution, Example 3*

13. **B** *Substitution, Example 4*

14. **A** *Substitution, Example 6*

15. **A** *Substitution, Example 7*

16. **A** *Substitution, Example 8*

17. **C** *Elimination, Example 1b*

18. **C** *Elimination, Example 2a*

19. **D** *Elimination, Example 2b*

20. **B** *Elimination, Example 2c*

21. **A** *Elimination, Example 3*

22. **C** *Elimination, Example 5*

23. **B** *Elimination, Example 7*

24. **B** *Elimination, Example 8*

Math 10C Practice Exam: Tips for Students

• Every question in the practice exam has already been covered in the Math 10C workbook. It is recommended that students refrain from looking at the practice exam until they have completed their studies for the unit.

• Do not guess on a practice exam. The practice exam is a self-diagnostic tool that can be used to identify knowledge gaps. Leave the answer blank and study the solution later.