

Chapter 3 Test - Algebra II - Mr. Lee

Study Guide

Multiple Choice

Identify the choice that best completes the statement or answers the question.

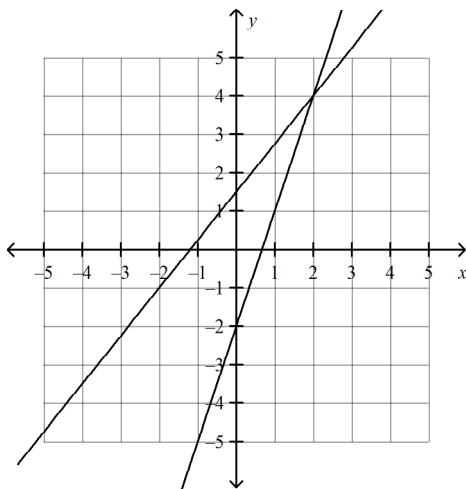
- _____ 1. Use substitution to determine if $(0, 2)$ is an element of the solution set for the system of equations.

$$\begin{cases} x + 3y = 6 \\ -x + y = 8 \end{cases}$$

- a. $(0, 2)$ is a solution of the system. b. $(0, 2)$ is not a solution of the system.

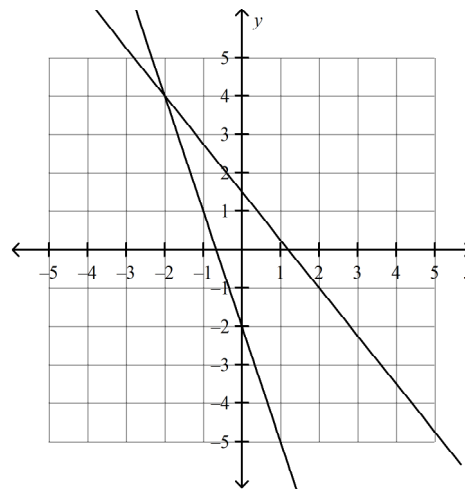
- _____ 2. Use a graph to solve the system $\begin{cases} -5x + 4y = 6 \\ 3x - y = 2 \end{cases}$. Check your answer.

a.



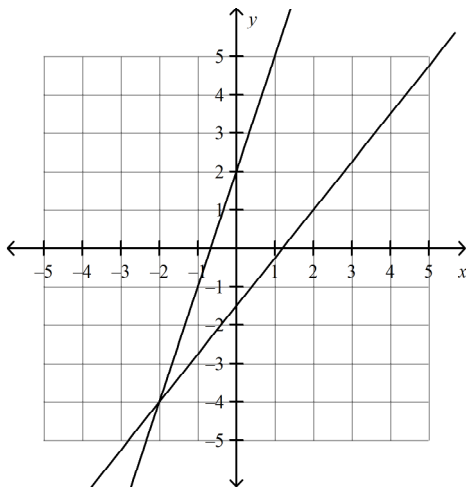
The solution to the system is $(2, 4)$.

c.



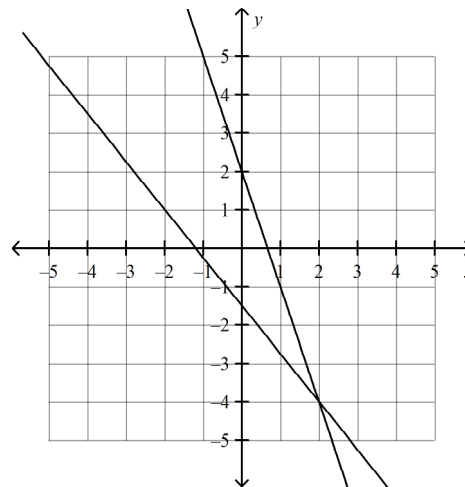
The solution to the system is $(-2, 4)$.

b.



The solution to the system is $(-2, -4)$.

d.

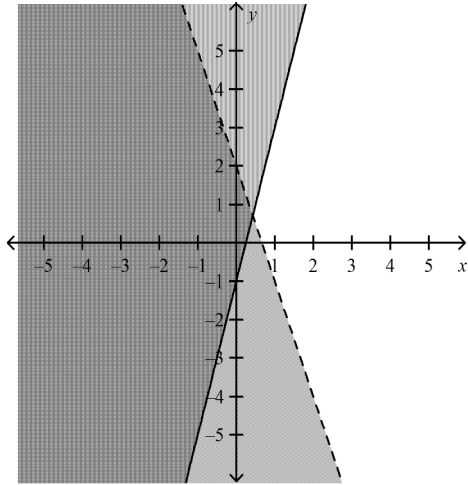


The solution to the system is $(2, -4)$.

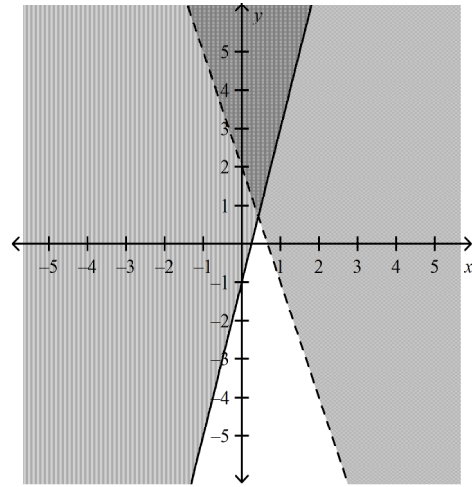
- _____ 3. Classify the system $\begin{cases} -7x - 6y = 4 \\ -28x - 24y = 16 \end{cases}$, and determine the number of solutions.
- This system is inconsistent. It has infinitely many solutions.
 - This system is inconsistent. It has no solutions.
 - This system is consistent. It has infinitely many solutions.
 - This system is consistent. It has one solution.
- _____ 4. Two snow resorts offers private lessons to their customers. Big Time Ski Mountain charges \$5 per hour plus \$50 insurance. Powder Hills charges \$30 per hour plus \$10 insurance. For what number of hours is the cost of lessons the same for each resort?
- 3 hours
 - 4 hours
 - 5 hours
 - 6 hours
- _____ 5. Use substitution to solve the system $\begin{cases} 3x + y = -3 \\ y = x + 5 \end{cases}$.
- $(-\frac{8}{3}, -3)$
 - $(-2, 3)$
 - $(-\frac{4}{3}, 1)$
 - $(3, -2)$
- _____ 6. Use elimination to solve the system $\begin{cases} 3x - 3y = 9 \\ x + 3y = 7 \end{cases}$.
- $(1, 4)$
 - $(0, -3)$
 - $(3, 0)$
 - $(4, 1)$
- _____ 7. Classify the system $\begin{cases} 5x - 8y = 18 \\ 40y - 25x = -90 \end{cases}$, and determine the number of solutions.
- The system is inconsistent and independent and has no solutions.
 - The system is inconsistent and dependent and has no solutions.
 - The system is consistent and dependent and has infinitely many solutions.
 - The system is consistent and independent and has infinitely many solutions.

8. Graph the system of inequalities $\begin{cases} y < -3x + 2 \\ y \geq 4x - 1 \end{cases}$.

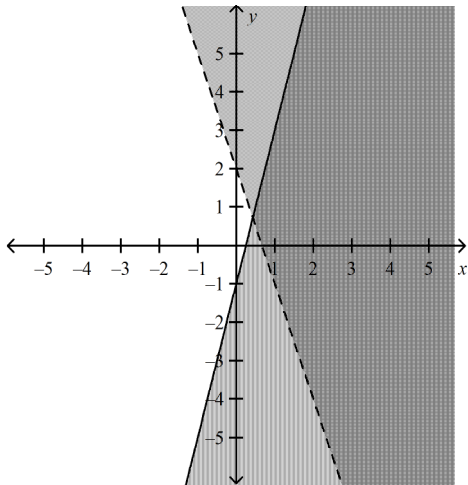
a.



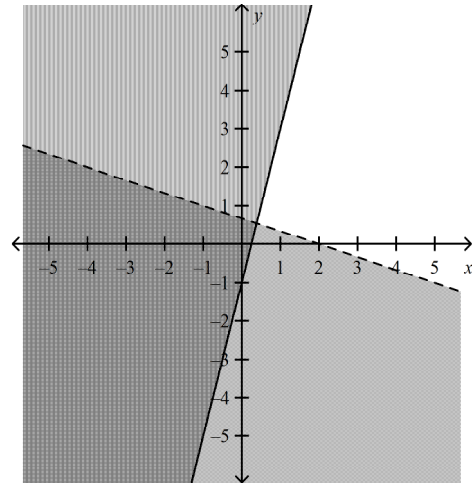
c.



b.

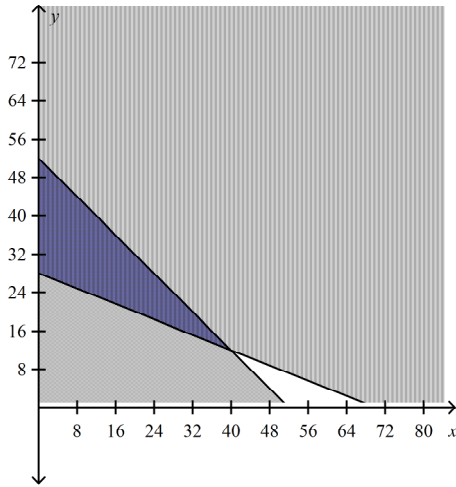


d.

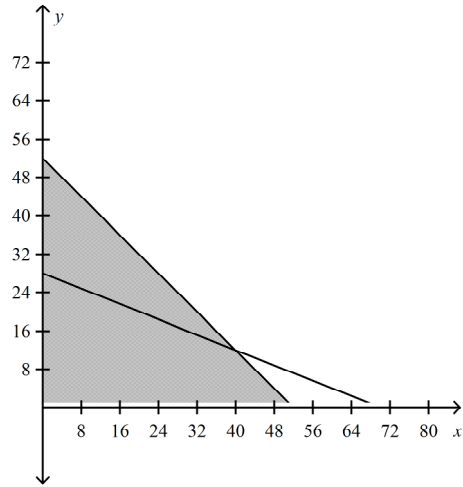


9. Mina's Catering Service is organizing a formal dinner for 280 people. The hall has two kinds of tables, one that seats 4 people and one that seats 10 people. The hall can contain up to a total of 52 tables. Write and graph a system of inequalities that can be used to determine the possible combinations of tables that can be used for the event so there are enough seats for all the people.

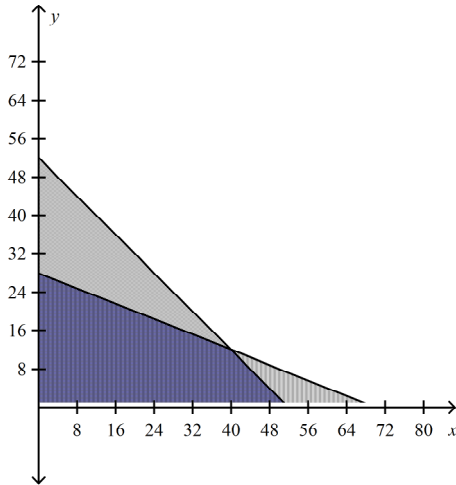
a.
$$\begin{cases} x + y \leq 52 \\ 4x + 10y \geq 280 \end{cases}$$



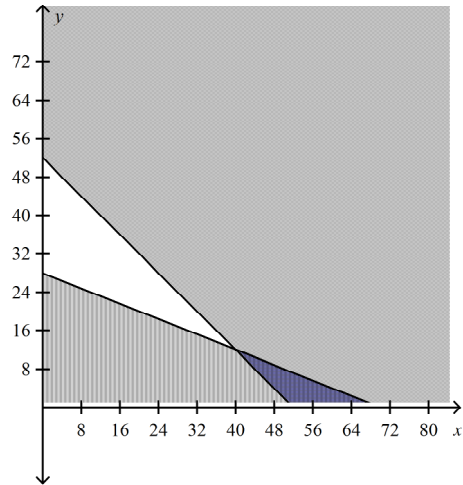
c.
$$\begin{cases} x + y \leq 52 \\ 4x + 10y = 280 \end{cases}$$



b.
$$\begin{cases} x + y \leq 52 \\ 4x + 10y \leq 280 \end{cases}$$



d.
$$\begin{cases} x + y \geq 52 \\ 4x + 10y \leq 280 \end{cases}$$

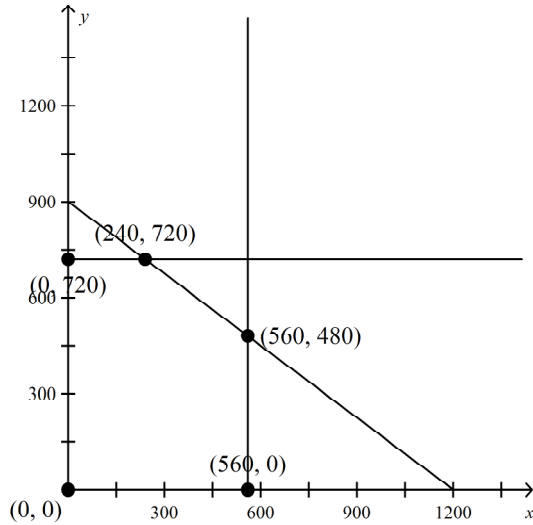


Name: _____

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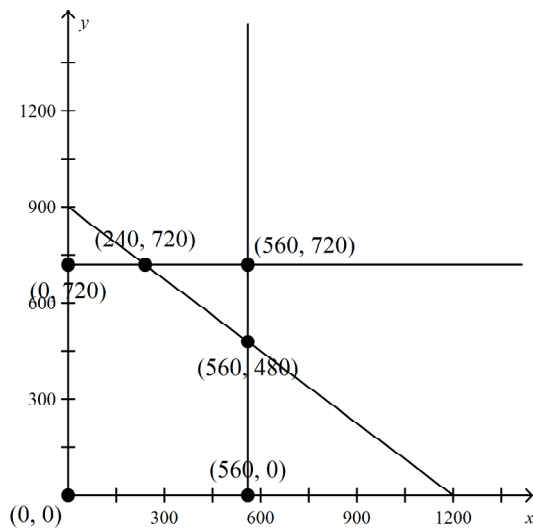
- _____ 10. A small publishing company is planning to publish 2 books this month: book A and book B. The publishing cost is \$6 each for book A and \$8 each for book B. The total cost can be no more than \$7,200. The company cannot publish more than 560 copies of book A and 720 copies of book B. The profit per book A is \$10, and the profit per book B is \$15. Find the number of books of each type that the company should publish to maximize its profits.

a.



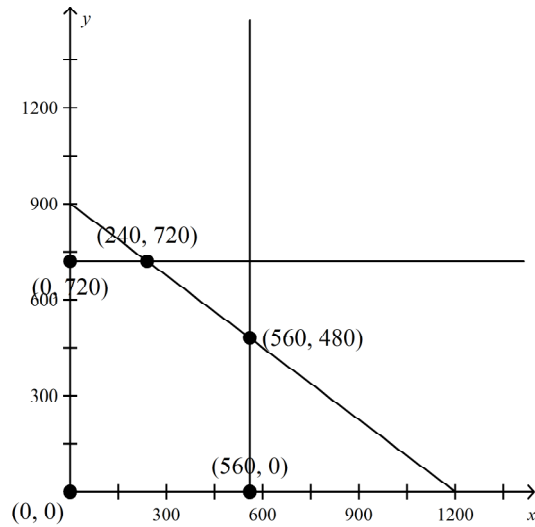
The objective function is maximized at $(240, 720)$, so the company should publish 240 copies of book A and 720 copies of book B.

b.



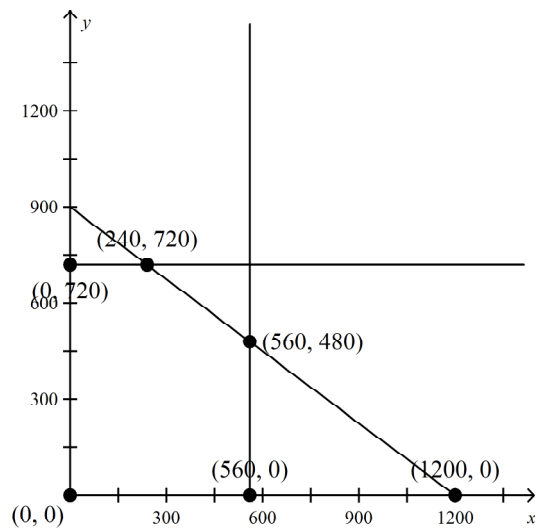
The objective function is maximized at $(560, 720)$, so the company should publish 560 copies of book A and 720 copies of book B.

c.



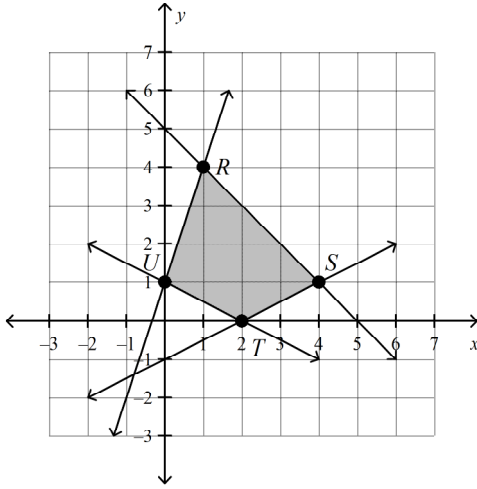
The objective function is maximized at $(540, 480)$, so the company should publish 540 copies of book A and 480 copies of book B.

d.



The objective function is maximized at $(1200, 0)$, so the company should publish 1200 copies of book A and 0 copies of book B.

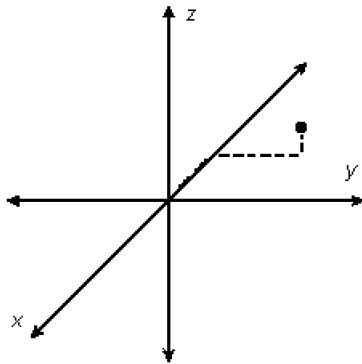
11. Which point gives the minimum value of $P = 3x - 2y$ in the feasible region shown?



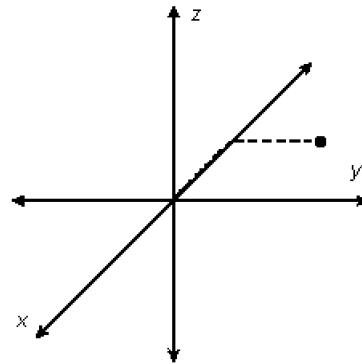
- a. $S(4, 1)$
- b. $R(1, 4)$
- c. $T(2, 0)$
- d. $U(0, 1)$

12. Graph $(-2, 3, 1)$ in three-dimensional space.

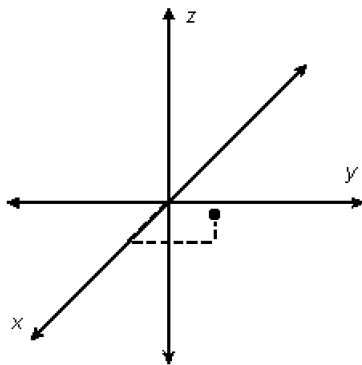
a.



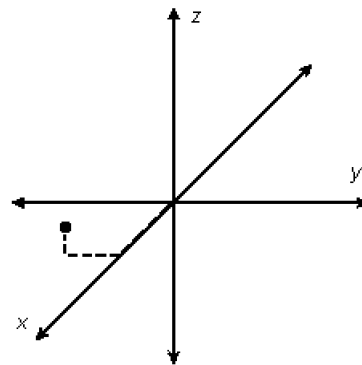
c.



b.



d.



Name: _____

ID: A

- _____ 16. Three venture capitalists each invested 7 million dollars into three companies: Darnell's Services, Stochy's, and Kammy's Clothing. Each venture capitalist divided the money differently, as shown in the table. The table also shows the gain for each venture capitalist for the year. Find the yield per year of each company.

Investor	Darnell's Services	Stochy's	Kammy's Clothing	Gain
B. O'Brian	2 million	3 million	2 million	35 million
L. Pham	4 million	1 million	2 million	31 million
R. Jackson	1 million	2 million	4 million	41 million

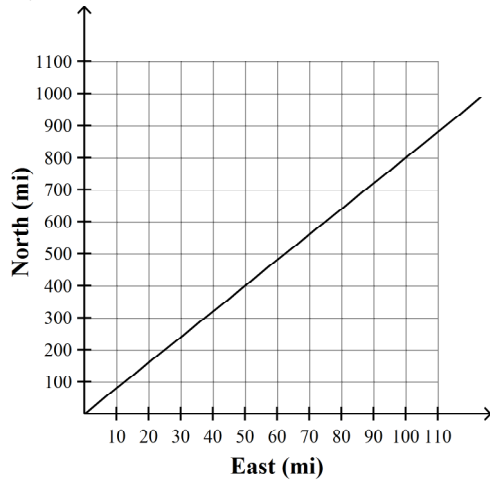
- a. Darnell's Services yielded 2 million dollars.
Stochy's yielded 6 million dollars.
Kammy's Clothing yielded 8 million dollars.
- b. Darnell's Services yielded 1 million dollars.
Stochy's yielded 7 million dollars.
Kammy's Clothing yielded 5 million dollars.
- c. Darnell's Services yielded 4 million dollars.
Stochy's yielded 4 million dollars.
Kammy's Clothing yielded 6 million dollars.
- d. Darnell's Services yielded 3 million dollars.
Stochy's yielded 5 million dollars.
Kammy's Clothing yielded 7 million dollars.

Name: _____

ID: A

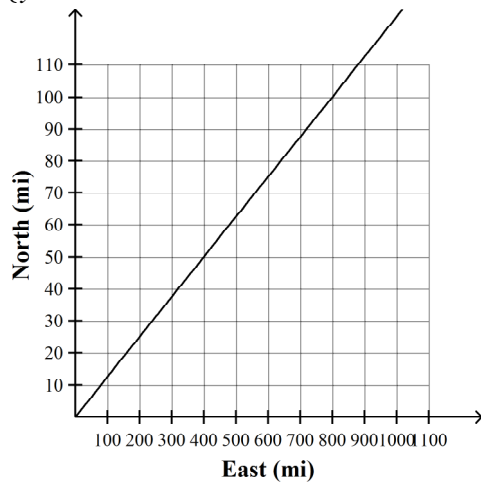
- _____ 17. Upon completing its ascent, an airplane cruises northeast at a steady rate. Its speed can be broken down into two components: 320 miles per hour due north and 40 miles per hour due east. Let due north be the direction of the positive y -axis and let due east be the direction of the positive x -axis. Assuming that the plane was at the origin upon attaining cruising altitude, write parametric equations to model the location of the plane. Then graph the equations on a coordinate grid. What is the position of the plane 15 minutes after reaching cruising altitude?

a.
$$\begin{cases} x = 40t \\ y = 320t \end{cases}$$



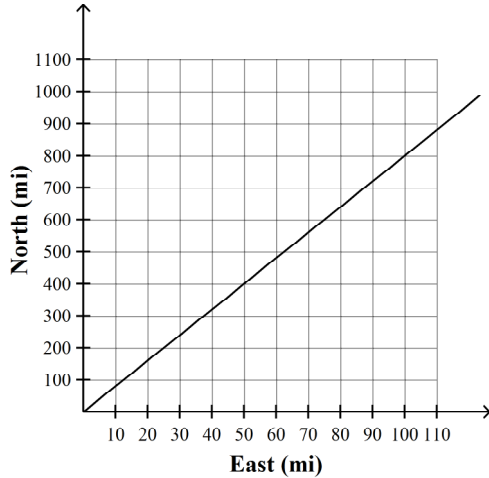
At $t = 0.25$ hours, the airplane is 10 miles east and 80 miles north of the origin.

b.
$$\begin{cases} x = 320t \\ y = 40t \end{cases}$$



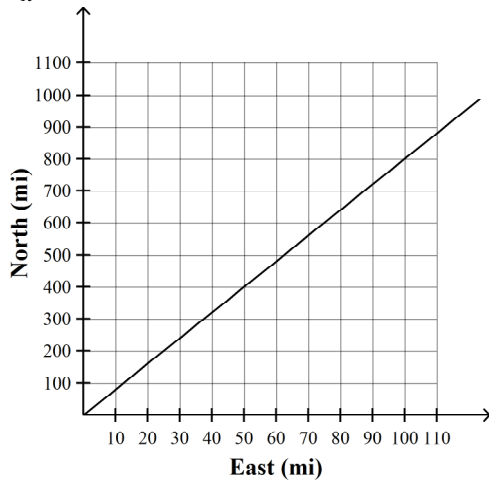
At $t = 0.25$ hours, the airplane is 80 miles east and 10 miles north of the origin.

c.
$$\begin{cases} x = 40t \\ y = 320t \end{cases}$$



At $t = 15$ minutes, the airplane is 600 miles east and 4,800 miles north of the origin.

d.
$$\begin{cases} x = 40t \\ y = 320t \end{cases}$$



At $t = 15$ minutes, the airplane is 15 miles east and 120 miles north of the origin.

Numeric Response

18. Manny works 40 hours per week. He must work for his parents where he earns \$8 per hour. He also works for a computer company where he earns \$20 per hour. What is the minimum number of hours Manny can work for the computer company to earn a total of \$464 per week from both jobs?

Matching

Match each vocabulary term with its definition.

- a. linear system
- b. system of equations
- c. consistent system
- d. dependent system
- e. inconsistent system
- f. independent system
- g. system of linear inequalities
- h. complex system
- i. standard system

- ___ 19. a system of equations containing only linear equations
- ___ 20. a system of equations or inequalities that has no solution
- ___ 21. a system of equations that has infinitely many solutions
- ___ 22. a set of two or more equations containing two or more variables
- ___ 23. a system of inequalities in two or more variables in which all of the inequalities are linear
- ___ 24. a system of equations that has exactly one solution
- ___ 25. a system of equations or inequalities that has at least one solution