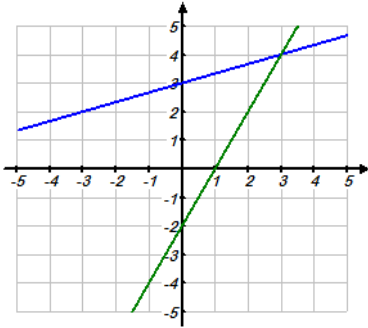


**Sec 6.4 – Mathematical Modeling
(Systems by Equations)**

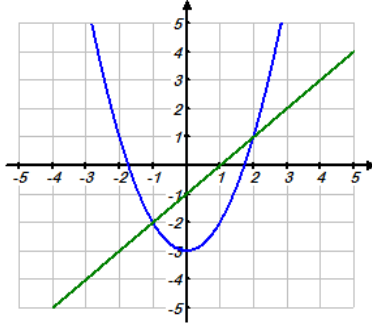
Name: _____

Each system of equation is shown in graph. Using the graph find the solutions to each of the systems.

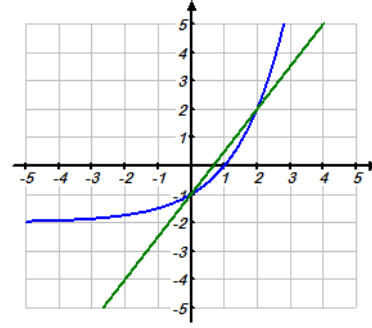
1. $y = \frac{1}{3}x + 3$
 $y = 2x - 2$



2. $y = x^2 - 3$
 $y = x - 1$



3. $y = 2^x - 2$
 $y = \frac{3}{2}x - 1$



Which of the system of equations below have a solution of (-3, 2) ?

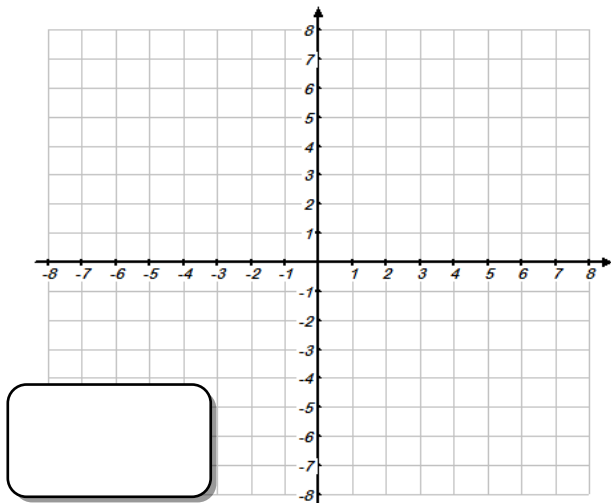
4. $\begin{cases} y = 2x + 8 \\ 3x + 2y = -5 \end{cases}$

5. $\begin{cases} y = \frac{2}{3}x + 4 \\ x = \frac{1}{2}y - 2 \end{cases}$

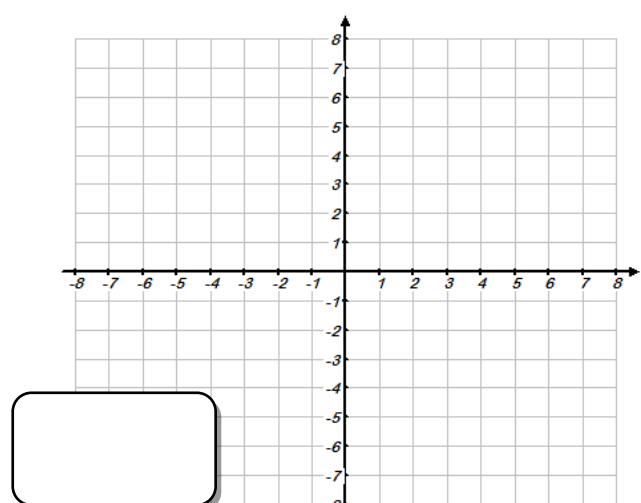
6. $\begin{cases} y + 2x = -4 \\ 3^y + x = 6 \end{cases}$

Graph each system and use the graph to determine a solution.

7. $\begin{cases} y = \frac{1}{2}x - 4 \\ y + 2x = 1 \end{cases}$



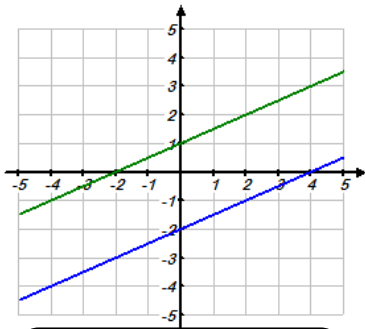
8. $\begin{cases} y = -3x - 6 \\ -2x + 3y = 15 \end{cases}$



Each system of equation is shown in graph. How many solutions does each system have?

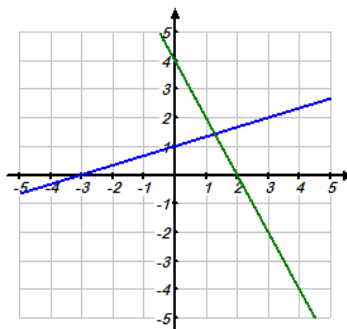
9. $y = \frac{1}{2}x - 2$

$y = \frac{1}{2}x + 1$



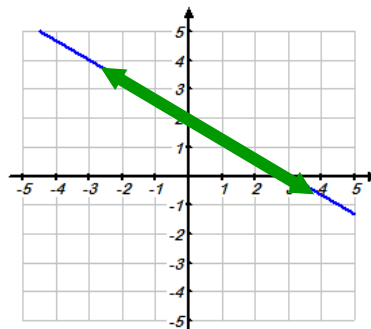
10. $y = \frac{1}{3}x + 1$

$y = -2x + 4$



11. $y = -\frac{2}{3}x + 2$

$y = -\frac{2}{3}x + 2$



Graph each system and use the graph to determine a solution.

12. $3y = 2x - 6$

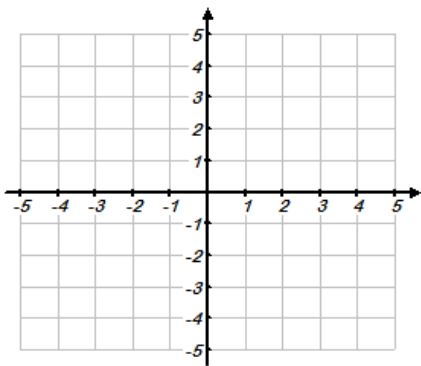
$4x - 6y = 12$

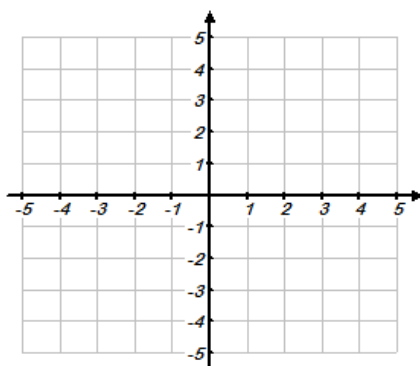
13. $4y - 7 = 2x + 1$

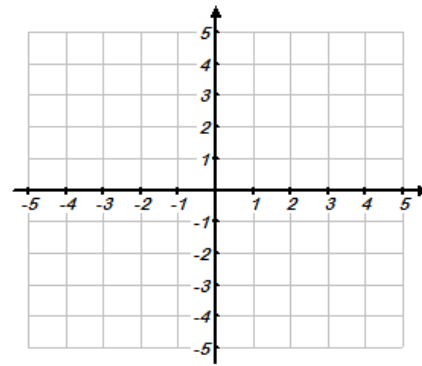
$2y - x = -6$

141. $2x = y + 2$

$3y = -2x + 9$







Solve each of the following systems using the substitution method.

15. $y = 2x + 5$
 $3x + 2y = -4$

16. $4x + 2y = 4$
 $x - 3y = 15$

Solve each of the following systems using the elimination method.

17. $2x - 3y = 9$
 $3x + 4y = 5$

18. $4x - 2y = 6$
 $-6x + 3y = -9$

19. The Turbo Taxi Service charges a flat rate of \$5 and then \$0.40 per mile. The Express Taxi Company charges a flat rate of \$2 and then \$0.75 per mile.

a. Write an equation that describes the cost, c , of each taxi cab in terms of miles, m , driven.

Turbo Taxi Service: $c =$

Express Taxi Co: $c =$



b. When do the two taxi cabs charge the same amount?

c. Describe when the Express Taxi Company charges more than Turbo Taxi Services.

20. A local school sold 230 tickets for their performance of Hamlet. They sold a combination of regular tickets and student tickets. The regular tickets sold for \$8 each and the student tickets sold for \$5. That night they collected \$1522 in ticket sales.

a. Write an equation that describes each piece of information. Let ' R ' represent the number of regular tickets and ' S ' represent the number of Student tickets.



b. Using the system of equations determine the number of each type of ticket that was sold.

Solve each of the following systems using the substitution method.

21. $y = 2z$
 $3x + 2y - z = 3$
 $2x + y + 4z = 10$

Solve each of the following systems using the elimination method.

22. $3x + 2y + z = 9$
 $5x + 4y - 3z = -5$
 $-2x + 3y + 5z = 8$