Unit 3 Linear Equations **Name:** _____

Day 1 Solve Systems of Equations By Graphing **Date:** _____ **Hour:** _____

(PH 7-1)

Two or more linear equations together form a **system of linear equations**. One way to solve a system of linear equations is by graphing each equation. Any ordered pair in a system that makes *all* the equations true is a solution of the system of linear equations.

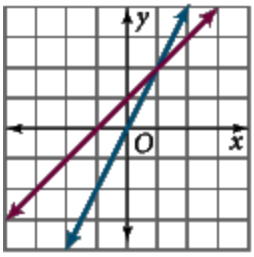
Example 1: Algebraically determine whether the given point is a solution for each pair of equations.

a. $\begin{aligned} 4x - y &= 4 \\ 3x - 2y &= 7 \end{aligned}$; $(3,8)$ _____

b. $\begin{aligned} y &= -x + 5 \\ y &= x + 9 \end{aligned}$; $(-2,7)$ _____

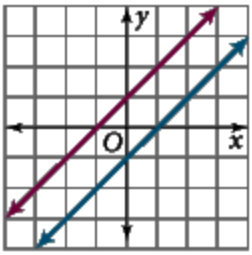
- **If the lines intersect, there is <u>one solution</u>. It is a consistent system with independent lines.**
- **If the lines are parallel, there is <u>no solution</u>. It is an inconsistent system with independent lines.**
- **If the lines are the same, there are <u>infinite solutions</u>. It is a consistent system with dependent lines.**

different slopes



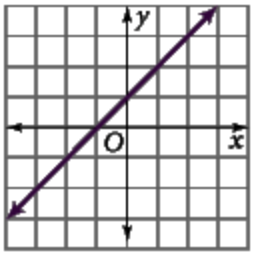
The lines intersect so there is one solution.

same slope
different *y*-intercepts



The lines are parallel so there are no solutions.

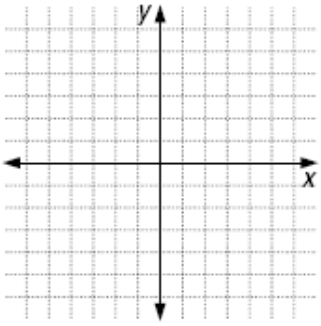
same slope
same *y*-intercept



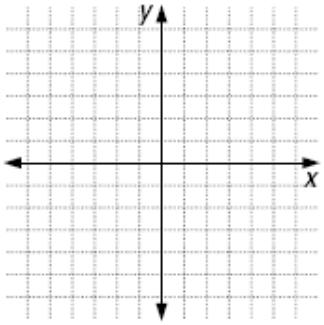
The lines are the same so there are infinitely many solutions.

Example 2: Solve by graphing. State if the system is consistent or inconsistent. Also state if it is dependent or independent. Check your solutions.

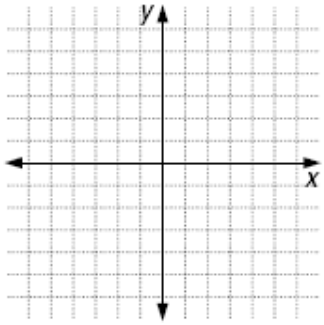
a. $\begin{aligned} y &= 2x - 3 \\ y + 1 &= x \end{aligned}$



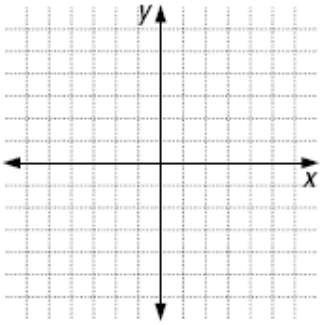
b. $\begin{aligned} y &= x + 5 \\ y &= -4x \end{aligned}$



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



When two lines are **parallel**, there are no points of intersection. So a system of linear equations has **no solution** when the graphs of the equations are pa



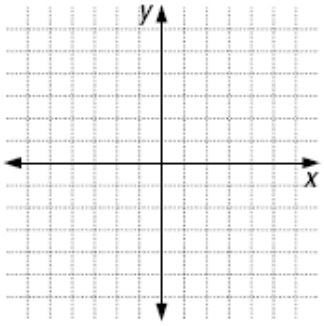
Example 3: Solve by graphing.

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

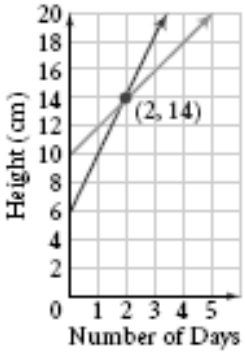
A system of linear equations has **infinitely many solutions** when the graphs of the equations are the **same line**. The coordinates of the points on the common line are all solutions of the system.

Example 4: Solve by graphing.

$$2x + 4y = 8$$
$$y = -\frac{1}{2}x + 2$$



Example 5: Suppose you are testing two fertilizers on bamboo plants A and B which are growing under identical conditions. Plant A is 6 cm tall and growing at a rate of 4 cm/day. Plant B is 10 cm tall and growing at a rate of 2 cm/day.



Label plant A and plant B.

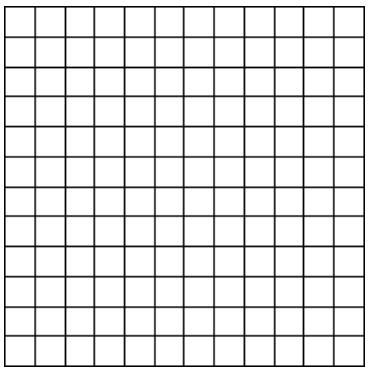
After how many days will the bamboo plants be the same height?

What will their height be?

Example 6: You are testing two fertilizers on bamboo plants C and D. Plant C is 5 cm tall and growing at a rate of 2 cm/day. Plant D is 7 cm tall and growing at a rate of 1 cm/day.

After how many days will the bamboo plants be the same height?

What will their heights be?



Homework: pg 343 #1-4 all, 5-13 odd, 15-24 all (skip 18), and additional exercises #1-4

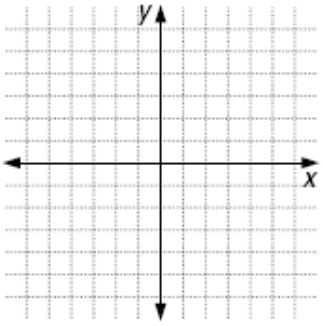
Unit 3 Linear Equations **Name:** _____

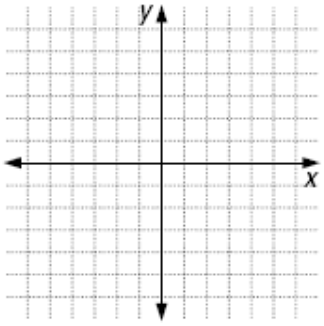
Day 1 Homework **Date:** _____ **Hour:** _____

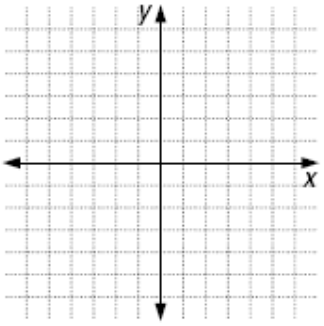
Show all work on a separate sheet of lined paper.

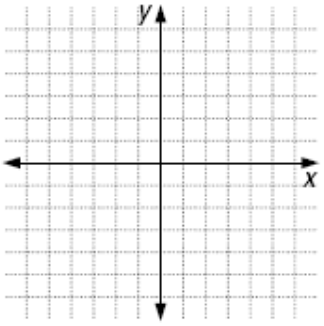
1. _____ 2. _____ 3. _____ 4. _____

5. _____ 7. _____ 9. _____ 11. _____

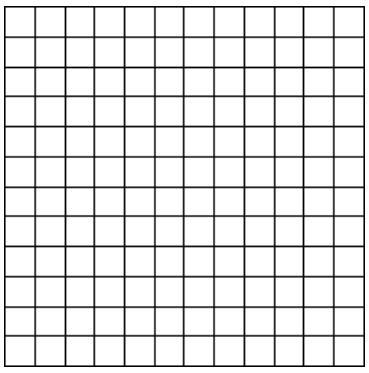
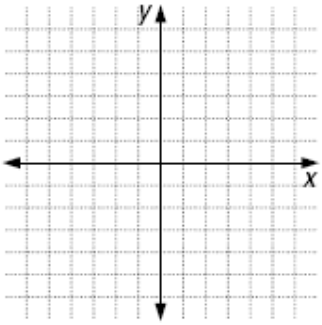


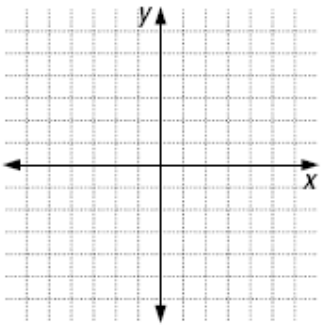


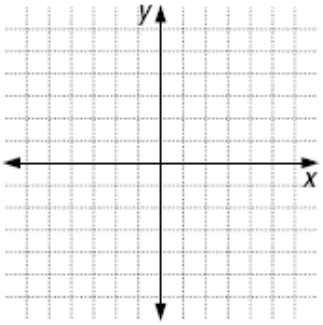




13. _____ 15. _____ 16. _____ 17. _____





19. _____ 20. _____ 21. _____ 22. _____

23. _____ 24._____

Additional exercises. Graph each system and find the solution from the graph.

1. $\begin{cases} y - 2x = 1 \\ y = 3 \end{cases}$ 2. $\begin{cases} 2y - x = 4 \\ y = \frac{1}{2}x + 5 \end{cases}$ 3. $\begin{cases} x = 4 \\ y = 1 \end{cases}$ 4. $\begin{cases} x + 3y = 15 \\ y = -\frac{1}{3}x + 5 \end{cases}$

_____ _____ _____ _____