Solving Systems of Linear Equations in Two Variables

Ex) Determine if the following points are a solution to the system of equations

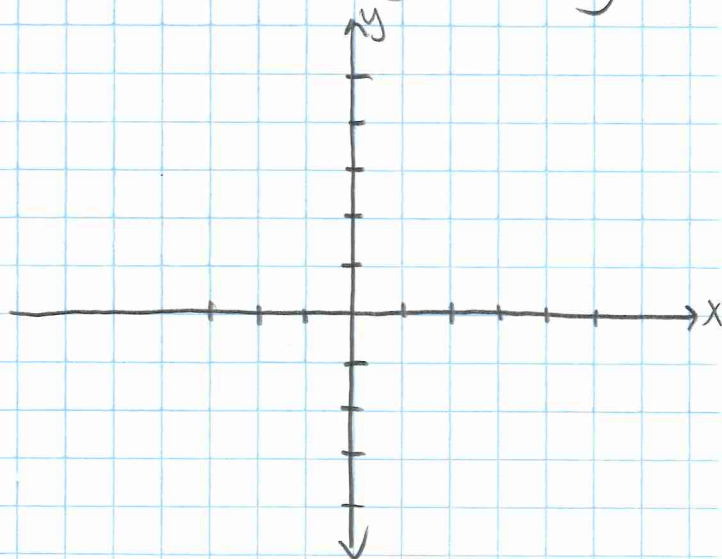$$\begin{cases} 2x - 3y = -4 \\ 2x + y = 4 \end{cases}$$

a. $(1, 2)$

b. $(7, 6)$

If a point is on two lines, what is special about this point?

Ex) Solving a system of eqns by graphing

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

Ex) Solving a system - Elimination Method

a. $\begin{cases} 3x - 4y = 11 \\ -3x + 2y = -7 \end{cases}$

Step P. Choose one variable to eliminate.
Ask yourself, "If I combine ① and
② can I get one of the variables
to cancel out?"

Step 1. Sometimes we have to modify one or
both of the eqns to get additive
inverses. We do this w/ multiplication.

Step 2. Combine (add), then solve.

Step 3. Back substitute to find the
other variable.

b. $\begin{cases} x + y = 11 \\ 2x - y = 13 \end{cases}$

c. $\begin{cases} 4x + 5y = 3 \\ 2x - 3y = 7 \end{cases}$

d. $\begin{cases} 2x = 9 + 3y \\ 4y = 8 - 3x \end{cases}$

EX) Solving a system - substitution method.

a. $\begin{cases} y = 3x - 7 \\ 5x - 2y = 8 \end{cases}$
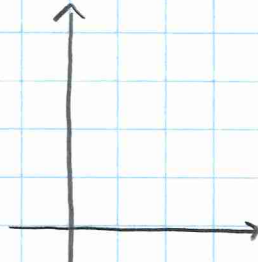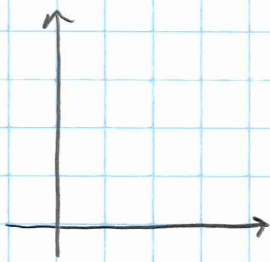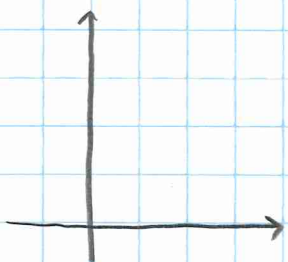
Step 1. Choose one eqn to solve for one variable.

Step 2. Substitute this into the other eqn and solve.

Step 3. Back substitute.

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

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

Recall: The solution to a system of equations is the

Ex) Solve the system algebraically

a) $\begin{cases} 5x - 2y = 4 \\ -10x + 4y = 7 \end{cases}$

b) $\begin{cases} x = 4y - 8 \\ 5x - 20y = -40 \end{cases}$

Systems of Equations and Problem Solving

EX) A school is selling tickets to a play. On the first day of ticket sales, the school sold 3 childrens tickets and 1 adult ticket for a total of $38. On the second day, the school took in $52 selling 3 childrens tickets and 2 adult tickets. Find the price of an adult ticket.

EX) A company that manufactures running shoes has a fixed cost of $300,000. If it costs $30 to make each pair and they sell them for $80 a pair, how many pairs must they sell to break even?

Ex) A first # is 7 greater than the second. Twice the first # is 4 more than 3 times the second. Find the numbers.

Ex) Two trains leave Tulsa, one traveling north and the other south. After 4 hrs, they are 376 miles apart. If one train is traveling 10 mph faster than the other what is the speed of each train? (Hint: d=rt)

Ex) A candy shop mixes M&M's worth $2.00 per pound with trail mix worth $1.50 per pound. Find how many pounds of each she should use to get 50 lbs of a party mix worth $1.80 per pound.

Graphing Linear Inequalities and Systems

*Graph just like a linear fxn except
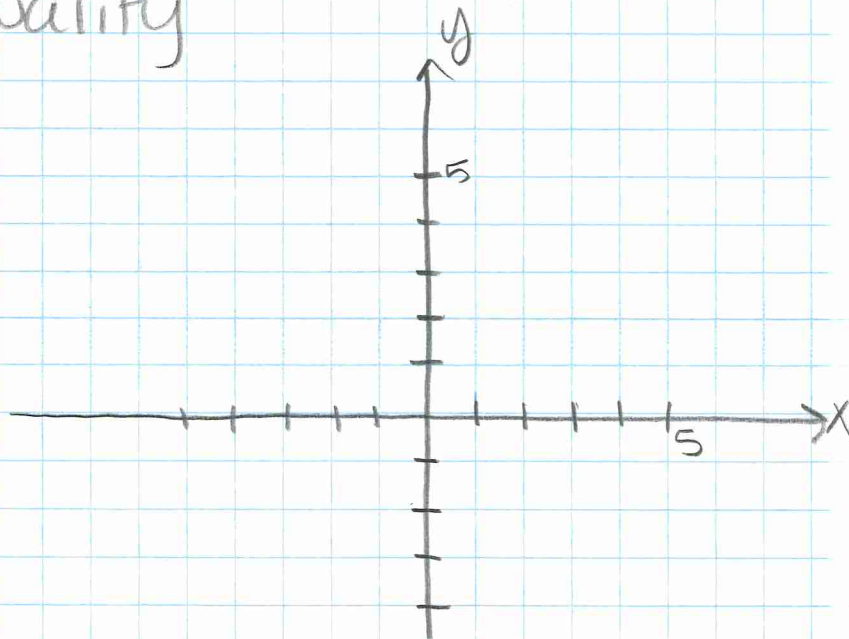
Use:
    solid line if
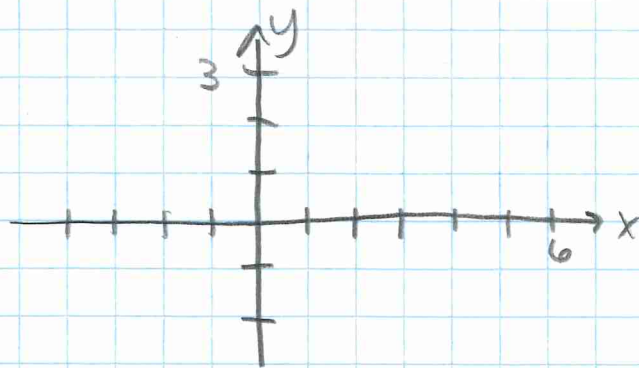   dashed line if

Shade:
    above if
    below if

    * or use a test point if unsure.
    If (x,y) is a solution to the
    inequality, then it <u>is</u> in the
    shaded region

EX) Graph the inequality
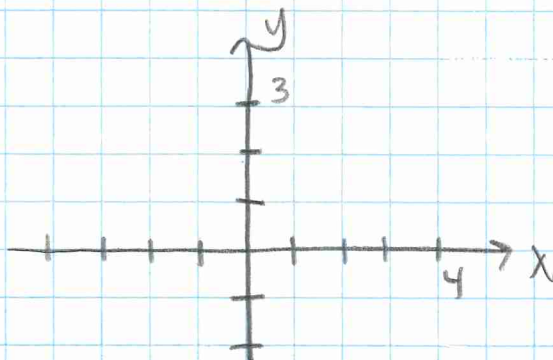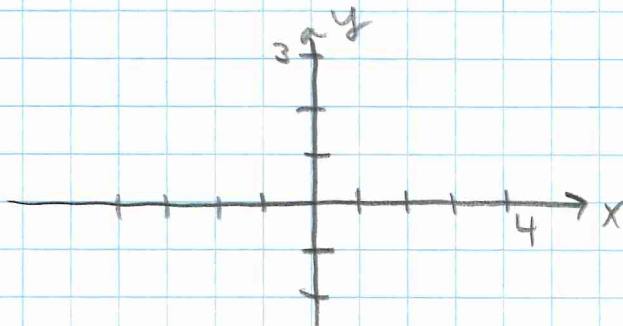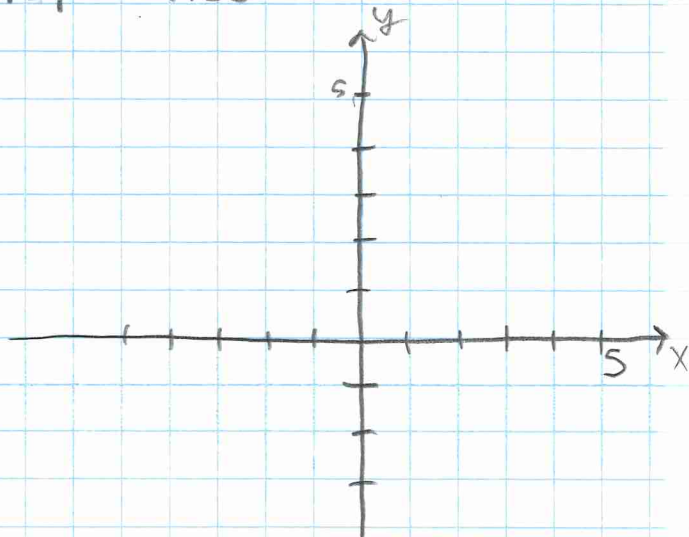   a $x + 3y > 4$

b. $x \leq 2y$

c. $x > -3$

d. $y - 4 \leq -2$

Ex) Graph the system of inequalities.

a. $\begin{cases} x \leq 2 \\ y \geq x + 1 \end{cases}$

b. $\begin{cases} x + 2y \leq 4 \\ y > -1 \end{cases}$