How do you solve a linear system by graphing?

Linear System

System of Equations

} 2 or more equations w/ 2 variables

Solution

(an) ordered pair that makes both equations true

Types of Systems:

Consistent

have ≥ 1 solution

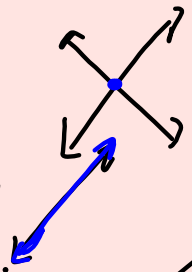
--Independent

has exactly 1 solution

--Dependent

has infinite solutions

same line!



Inconsistent

has NO solution

parallel lines → same slope diff. y int

To solve by graphing:

1) Graph lines! → ① y = mx+b OR ② x & y intercepts

2) look @ point of intersection (x,y)

3) plug in to BOTH equations to check!

To write a system:

1) what do x & y represent?

2) what is each equation about?

Examples:

20. Determine whether each of the following systems of equations have one solution, infinitely many solutions, or no solution. Select the correct answer for each lettered part.

a. $\begin{cases} x+y=5 \\ -6y-6y=30 \end{cases}$

b. $\begin{cases} x+y=7 \\ 5x+2y=23 \end{cases}$

c. $\begin{cases} 3x+y=5 \\ 6x+2y=12 \end{cases}$

d. $\begin{cases} 2x+5y=-12 \\ x+7y=-15 \end{cases}$

e. $\begin{cases} 3x+5y=17 \\ -6x-10y=-34 \end{cases}$

Answer:

How do you solve a linear system by substitution!

Substitution Method

Steps:

Plug in 1 variable in place of another!

1) Isolate one variable in one equation

look for no coeff.

$3x+y=20$ → $y=20-3x$

$-3x-6y=-60$

2) In second equation, replace THAT variable with *resulting expression*

$2x-6(20-3x)=-60$

3) Solve for remaining variable

D. $2x-6(20-3x)=-60$

CLT $2x-120+18x=-60$

$20x-120=-60$

$+120 \quad +120$

$\frac{20x}{20}=\frac{60}{20}$

$x=3$

4) Go back, plug in what you found to find the OTHER variable!

$y=20-3(3)$

$20-9=11$

5) CHECK! (in the other equation)

$2(3)-6(11) \stackrel{?}{=} -60$ ✓

$6-66=-60$

$(3,11)$

You Try!

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

Answer:

How do you solve systems by elimination?

Elimination

AKA

combination

Solving by combining 2 equations to eliminate one variable and solve for the other

Steps:

1) Put both equations in standard form

2) Decide which variable to eliminate--- multiply one or both variables so that coefficients are ADDITIVE INVERSES

3) Combine equations

4) Solve for remaining variable

5) Plug that value into 1 equation to solve for the OTHER variable

6) Check in other equation!

5. $\begin{cases} 2x + 3y = -1 \\ 5x - 2y = -12 \end{cases}$

$4x + 6y = -2$

$+\ 15x - 6y = -36$

$19x = -38$

$x = -2$

$2(-2) + 3y = -1$

$-4 + 3y = -1$

$3y = -3$

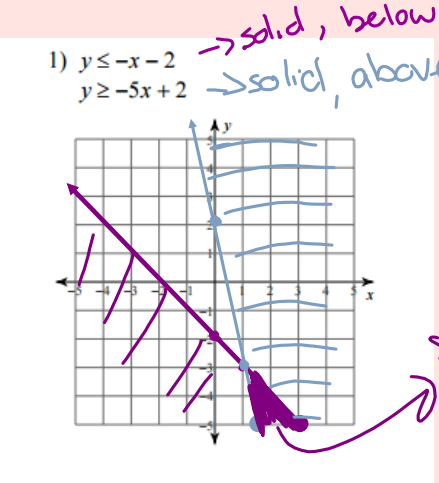
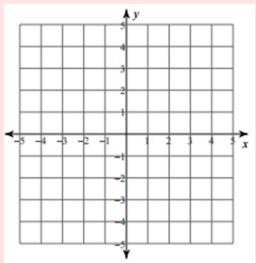
$y = -1$

$(-2, 1)$

check: $5(-2) - 2(1) \stackrel{?}{=} -12$ ✓

Answer:

How do you graph the solutions to a system of linear inequalities?

System of Linear Inequalities	2 or more linear inequalities in the form $y > mx + b$ or $ax + by < c$
Rules for graphing inequalities	1) Graph as $y = mx + b$ 2) Line- dashed OR solid? 3) Shaded- above OR below? Graph each inequality & shade! Look for area that overlaps! Test point! ---if not shaded by both, NOT a solution!
example	
You Try!	$2x + 3y > 6$ $x - 4y \le 8$ 

Answer: