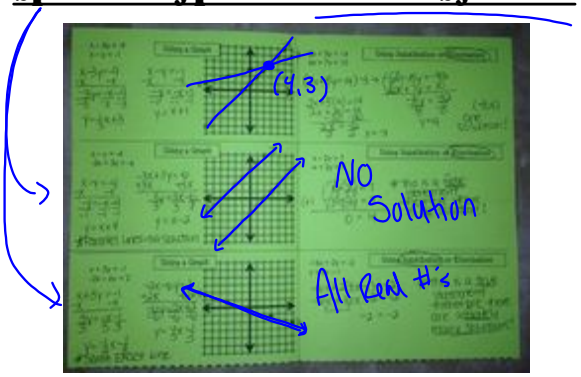
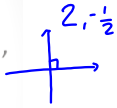
Special Types of Linear Systems



Systems can be. . .

1. Intersecting lines- one solution, different slopes
2. Perpendicular lines- one solution, slopes are opposite reciprocals
3. Parallel lines- no solution, same slope and different y-intercepts
4. Same line (lines coincide)- infinite solutions, same slope and same y-intercepts

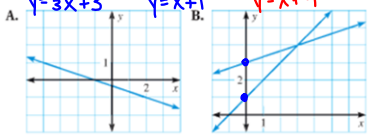


I. Match the system with its graph. State the number of solutions

B 1. $x - 3y = -9$, $x - y = -1$
$x-3y=-9$, $-3y=-x-9$, $y=\frac{1}{3}x+3$
$x-y=-1$, $-y=-x-1$, $y=x+1$

C 2. $x - y = -4$, $-3x + 3y = 2$
$x-y=-4$, $-y=-x-4$, $y=x+4$

A 3. $x + 3y = -1$, $-2x - 6y = 2$

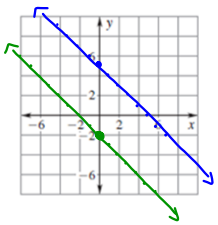


II. Graph the system. Tell whether there is one, no, or infinitely many solutions.

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

$x+y=-2$, $y=-x-2$, $m=-1$, $b=-2$

$y=-x+5$, $m=-1$, $b=5$



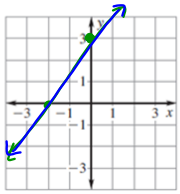
No Solution

II. Graph the system. Tell whether there is one, no, or infinitely many solutions.

5. $\begin{cases} -9x+6y=18 \\ 6x-4y=-12 \end{cases}$

$-9x+6y=18$, $6y=9x+18$, $y=\frac{3}{2}x+3$

$6x-4y=-12$, $-4y=-6x-12$, $y=\frac{3}{2}x+3$



Infinitely Many Solutions

III. Solve by substitution or elimination

6. $\begin{cases} -16x+2y=-2 \\ y=8x-1 \end{cases}$

$-16x+2(8x-1)=-2$

$-16x+16x-2=-2$

$-2=-2$

Infinitely Many Solutions

III. Solve by substitution or elimination

$$\begin{cases} 6x+3y=9 \\ 2x+9y=27 \end{cases}$$

$3(6x+3y=9)$

$18x+9y=27$

$-\ 2x+9y=27$

$16x=0$

$\frac{16x}{16}=\frac{0}{16}$

$x=0$

$2(0)+9y=27$

$9y=27$

$y=3$

$(0,3)$

One Solution

III. Solve by substitution or elimination cont.

8. $\begin{cases} -18x+6y=24 \\ 3x-y=-2 \end{cases}$

$(3x-y=-2)6$

$-18x+6y=24$

$+\ 18x-6y=-12$

$0=12$

No Solution

IV. Without solving, tell whether the system has one, no, or infinitely many solutions

9. $\begin{cases} y=7x+13 \\ -21x+3y=39 \end{cases}$

$y=7x+13$

$-21x+3y=39$

$\frac{3y}{3}=\frac{21x}{3}+\frac{39}{3}$

$y=7x+13$

Infinitely Many Solutions

IV. Without solving, tell whether the system has one, no, or infinitely many solutions

10. $\begin{cases} 0.3x+0.4y=2.4 \\ 0.5x-0.6y=0.2 \end{cases}$

One Solution

$0.3x+0.4y=2.4$

$\frac{0.4y}{0.4}=\frac{-0.3x}{0.4}+\frac{2.4}{0.4}$

$y=-.75x+6$

$y=-\frac{3}{4}x+6$

$0.5x-0.6y=0.2$

$\frac{-0.6y}{-.6}=\frac{-0.5x}{-.6}+\frac{0.2}{-.6}$

$y=.8\overline{3}x$

$y=\frac{5}{6}x-\frac{1}{3}$

IV. Continued

11. $\begin{cases} 12x-15y=27 \\ 8x-10y=16 \end{cases}$

V. Story Problem

12.

RECREATION One admission to a roller skating rink costs x dollars and renting a pair of skates costs y dollars. A group pays $243 for admission for 36 people and 21 skate rentals. Another group pays $81 for admission for 12 people and 7 skate rentals. Is there enough information to determine the cost of one admission to the roller skating rink? *Explain.*