Notes on Solving Systems in 2-variables

Name: Date:

System of Equations – Fill in Notes Block:

1. What is a solution to a system of equations?

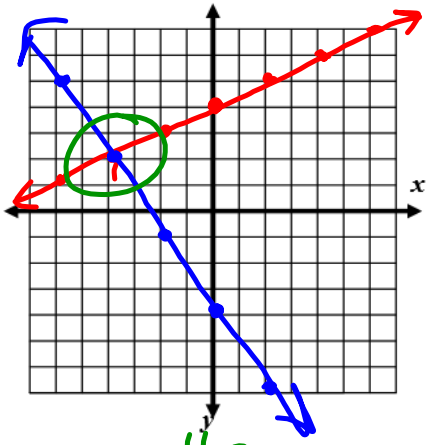
1. coordinate point (x, y) 3. infinitely many solutions (same line true statement)

2. (parallel lines) no solution (false statement)

#2-3: Find the solution to the system of equations by graphing.

2. $y = -\frac{3}{2}x - 4$

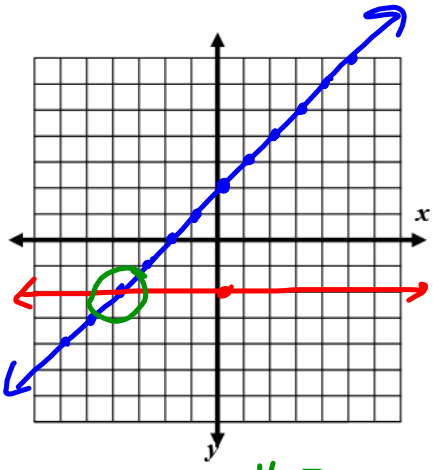
$y = \frac{1}{2}x + 4$



Solution (-4, -2)

3. $y = x + 2$

$y = -2$



Solution (-4, -2)

4. If the equations have the same rate of change, what would be the solution to the system of equations? Explain your answer.

Same slope means parallel lines → "no solution"

5-7: Solve the system of equations using substitution.

5. $4x + 3y = 31$

$y = 2x + 7$

$y = 2(1) + 7$

$y = 9$

$4x + 3(2x+7) = 31$

$4x + 6x + 21 = 31$

$10x + 21 = 31$

$-21 \quad -21$

$10x = 10$

$x = 1$

(1, 9)

6. $-2x + 2y = 8$

$-x + y = 4$

$y = 4 + x$

$-2x + 2(4+x) = 8$

$-2x + 8 + 2x = 8$

$8 = 8$

infinitely many solutions

(-2, -7)

7. $-2x + y = -3$

$5x - 2y = 4$

$y = 2x - 3$

$5x - 2(2x-3) = 4$

$5x - 4x + 6 = 4$

$x + 6 = 4$

$x = -2$

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

$4 + y = -3$

$y = -7$

Notes on Solving Systems in 2-variables

#8-10: Solve each system of equations using elimination.

8. $3x + 3y = -6$
$x + 2y = 6$

$-3(x + 2y = 6)$
$3x+3y=-6$
$-3x-6y=-18$
$-3y=-24$
$y=8$

$x+2(8)=6$
$x+16=6$
$x=-10$
$(-10,8)$

9. $3x - 9y = 2$
$2x + 3y = -12$

$(-6,0)$
$2x+3(0)=-12$
$\frac{2x}{2}=\frac{-12}{2}$
$x=-6$

10. $5x - 4y = -30$
$2x + 3y = -12$

$2(5x-4y=-30)$
$-5(2x+3y=-12)$
$10x-8y=-60$
$-10x-15y=-120$
$-23y=0$
$y=0$

#11-12: Solve each system of equation using the method of your choice. For full credit define your variables, write two equations and show all your work. Explain why you chose the method you used.

11. Your math teacher tells you that next week's test is worth 100 points and contains 38 problems. Each problem is worth either 5 points or 2 points. How many problems are worth 5 points? 2 points?

Variables: x = # of problems worth 5 points
y = # of problems worth 2 points

Equations:

Problems: $x+y=38$

Points: $5x+2y=100$

Solution: 8 problems are worth 5 points and 30 problems are worth 2 points.

Method & Why:

12. You used 50 tickets to ride the ferris wheel and the roller coaster. If you ride 12 times, using 3 tickets for each Ferris wheel ride and 5 tickets for each roller coaster ride, how many times did you go on each ride?

Variables:

Equations:

Solution:

Method & Why: