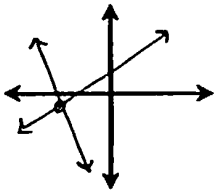
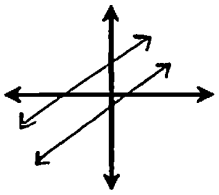
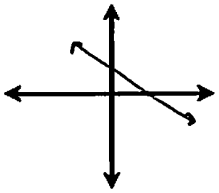
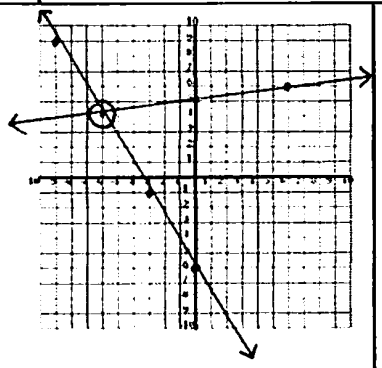
Name: Key	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
System of Equations	Two or more linear equations
Types of Solutions	 **Intersecting Lines**  **No Solution** Parallel Lines  **Infinite Solution** same line
Solve by Graphing	Solve each system of equations below by graphing. Identify the solution.

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

$y=\frac{1}{6}x+5$

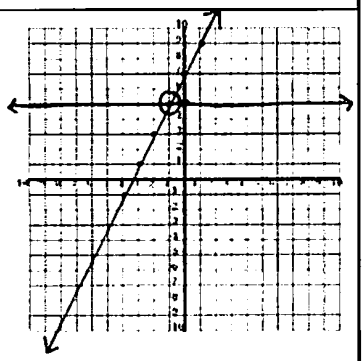
$(-6,4)$



2. $y=5$

$y=2x+7$

$(-1,5)$



3. $6x-5y=-45$

$2x+2y=-4$

$6x-5y=-45$

$-5y=-6x-45$

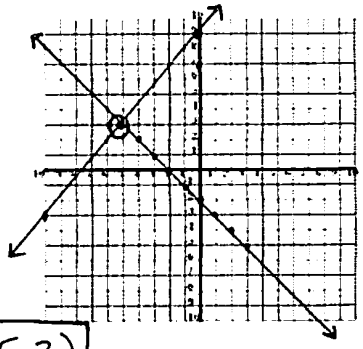
$y=\frac{6}{5}x+9$

$2x+2y=-4$

$2y=-2x-4$

$y=-x-2$

$(-5,3)$



4. $3x+6y=-12$

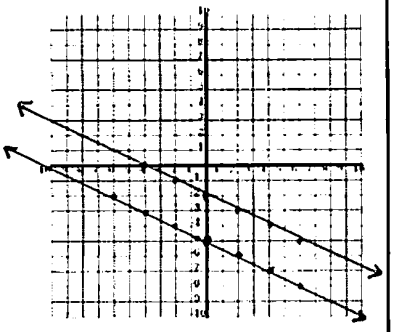
$y=-\frac{1}{2}x-5$

$3x+6y=-12$

$6y=-3x-12$

$y=-\frac{1}{2}x-2$

No Solution



5. $2y=8x+18$

$24+4y=x$

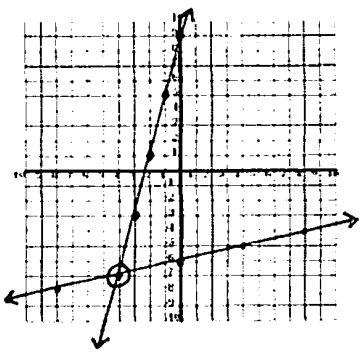
$2y=8x+18$

$y=4x+9$

$24+4y=x$

$4y=x-24$

$y=\frac{1}{4}x-6$



6. $-y=-x-6$

$3x+18=3y$

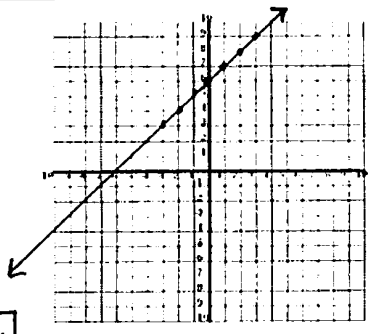
$-y=-x-6$

$y=x+6$

$3x+18=3y$

$x+6=y$

Infinite Solutions



Solve by Substitution

①	**SOLVE** one equation for x or y. (Isolate a variable)
②	**SUBSTITUTE** the resulting equation from step 1 into the other equation for that variable.
③	**SOLVE** for the remaining variable.
④	**SUBSTITUTE** your answer from step 3 into either original equation to find the other variable.

Directions: Solve each system of equations below by substituion. Identify the solution.

7. $y = -7x - 1$
$y = x - 9$

$x - 9 = -7x - 1$
$-9 = -8x - 1$
$-8 = -8x$
$1 = x$

$y = 1 - 9$
$y = -8$

$(1, -8)$

8. $y = -5x + 30$
$7x + 3y = 42$

$7x + 3(-5x + 30) = 42$
$7x - 15x + 90 = 42$
$-8x = -48$
$x = 6$

$y = -5(6) + 30$
$y = 0$

$(6, 0)$

9. $6x - 5y = -28$
$7x + y = 22 \rightarrow y = -7x + 22$

$6x - 5(-7x + 22) = -28$
$6x + 35x - 110 = -28$
$41x = 82$
$x = 2$

$7(2) + y = 22$
$y = 8$

$(2, 8)$

10. $x - 7y = 53 \rightarrow x = 7y + 53$
$-4x - 5y = 19$

$-4(7y + 53) - 5y = 19$
$-28y - 212 - 5y = 19$
$-33y = 231$
$y = -7$

$x - 7(-7) = 53$
$x = 4$

$(4, -7)$

11. $2y = 6x + 10 \rightarrow y = 3x + 5$
$3x - y = 5$

$3x - (3x + 5) = 5$
$-5 \neq 5$

$\emptyset$

12. $5x + 7y = -17$
$4x - 3y = -5 \rightarrow 4x + 5 = 3y$
$\frac{4}{3}x + \frac{5}{3} = y$

$5x + 7\left(\frac{4}{3}x + \frac{5}{3}\right) = -17$
$5x + \frac{28}{3}x + \frac{35}{3} = -17$
$\frac{43}{3}x + \frac{35}{3} = -17$
$43x + 35 = -51$
$43x = -86$
$x = -2$

$4(-2) - 3y = -5$
$-8 - 3y = -5$
$-3y = 3$
$y = -1$

$(-2, -1)$

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