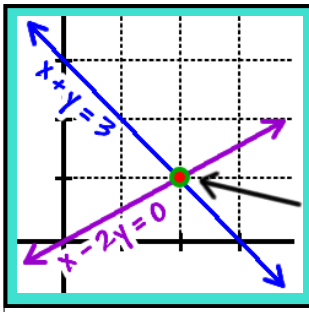
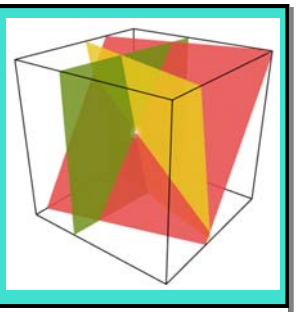


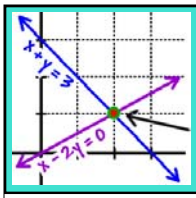
Unit 6: Systems of Equations

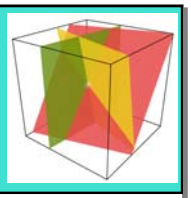


6.3 Solving Systems by Substitution

Steps

1. Choose the simpler equation.
2. Isolate a variable (x or y).
3. Substitute the expression from 2 into the other equation.
4. Distribute/Combine like terms to solve for a variable (x=7).
5. Substitute the number (found in 4) into an original equations in place of x or y.
6. Simplify and solve for the other variable.
7. Write answer as an **ordered pair.**
8. Verify.





Ex.) Solve the following system of equations through substitution.

$x + 4y = 17$ $\quad -4y \quad -4y$

$x = (17 - 4y)$

$2x - y = 7$

$2(17 - 4y) - y = 7$

$34 - 8y - y = 7$

$34 - 9y = 7$

$-34 \quad -34$

$\frac{-9y}{-9} = \frac{-27}{-9}$

$y = 3$

$x = 17 - 4(3)$

$x = 5$

$(5, 3)$

Ex.) Solve the following system of equations through substitution.

$4x + 3y = 0$ $\quad -4x \quad -4x$

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

$y = (-\frac{4}{3}x)$

$8x - 9y = 5$

$8x - 9(-\frac{4}{3}x) = 5$

$8x + 12x = 5$

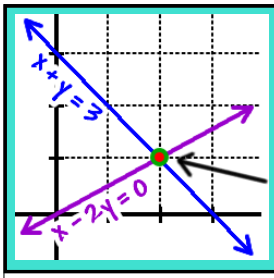
$\frac{20x}{20} = \frac{5}{20}$

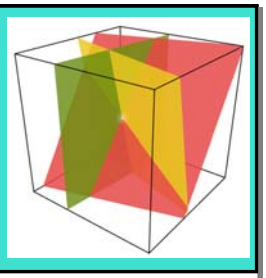
$x = 1/4$

$Y = (-\frac{4}{3})(\frac{1}{4})$

$Y = -1/3$

$(\frac{1}{4}, -\frac{1}{3})$





Ex.) Solve the following system of equations through substitution.

$5(2a-3)+b=5$ $\quad 6a-2(b-4)=20$

$10a-15+b=5$ $\quad 6a-2b+8=20$

$-10a+15 \quad -10a+15$

$b=(-10a+20)$

$6a-2(-10a+20)+8=20$

$b=-10(2)+20$

$6a+20a-40+8=20$

$b=0$

$26a-32=20$

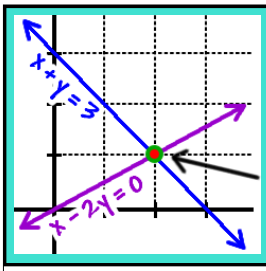
$+32 \quad +32$

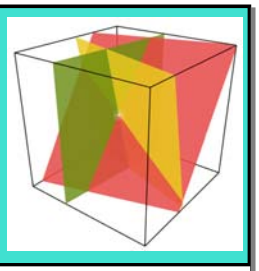
$(2,0)$

$\frac{26a}{26}=\frac{52}{26}$

$a \quad b$

$a=2$





Review:

How can you determine the number of solutions by looking at an equation in slope y-intercept form?

	0	1	∞
m	same	diff	same
b	diff	doesn't matter	same

Review: parallel

Solve the following system of equations through graphing.

$y=-2x+9$ $\quad y=3x-7$

$\left(\frac{16}{5}, \frac{13}{5}\right)$