

It doesn't matter if x = # of chickens or the # of pigs. See below.

Let X= #of pigs Let Y= #of chickens  $X+y=60 \implies y=60-x$  4x+2y=162 4x+2(60-x)=162 4x+120=2x=162 2x+120=120  $\frac{2x=42}{2}$  x=21[21 pigs]



How to solve #4.

Isolate y in second equation, and substitute in to the first equation.

$$4x - y = 6$$

$$4x - b = y$$

$$3x + 2(4x - b) = 10$$

$$3x + 8x - 12 = 10$$

$$11x - 12 = 10$$

$$+ 12 + 12$$

$$11x = 22$$

$$11 = 11$$

$$x = 2$$

Multiply the second equation by 2. Now you can eliminate y by addition.



$$3(a)+2y=10$$
  
 $b + 2y=10$   
 $-b - - b$   
 $2y=4$   
 $2y=2$   
 $y=2$ 

(2, 2)

O

1. Is System B below equivalent to System A? Explain.

System A	System B
$\begin{cases} 3x + 2y = 10\\ 4x - y = 6 \end{cases}$	$\begin{cases} 3x + 2y = 10\\ 8x - 2y = 12 \end{cases}$

- **2.** Use the combination method to solve System B.
- 3. Check that your solution also satisfies System A.

$$+ \frac{3x + 2y = 10}{8x - 2y = 12}$$

$$+ \frac{3(2) + 2y = 10}{11 \times 2}$$

$$\frac{3(2) + 2y = 10}{52y = 10}$$

$$\frac{5(2) + 2y = 10}{52y = 10}$$

$$\frac{5(2) + 2y = 10}{-5}$$

$$3xt2y = 10 \qquad 4x - y = 6 
4x - y = 6 \qquad 4(2) - (2) = 6 
8 - 2 = 6 
6 = 6 \$$

## Let's try what we just figured out.

- **D** For each system:
  - Write an equivalent system that is easy to solve using the combination method.
  - · Solve the system.
  - Check that your solution also satisfies the original system.

1. 
$$\begin{cases} 2x + 2y = 5\\ 3x - 6y = 12 \end{cases}$$

**4**  $\begin{cases} x + 3y = 4 \\ 4x + 5y = 2 \end{cases}$ 

3[2x+2y=5] 3x-6y=12

$$\begin{array}{c} 3x + 2y = 5 \\ 3(3) + 2y = 5 \\ -6 - 6 \\ -6 - 6 \\ -6 \\ -2y = -1 \\ 2y = -1 \\ -2 \\ y = -2 \end{array} \quad (3, -1)$$

$$4x + 12y = 16$$

$$- 4x + 5y = 2$$

$$7y = 14$$

$$7y = 14$$

$$7 = 7$$

$$y = 2$$

$$(-2, 2)$$

$$x + 3y = 4$$

$$x + 5 = 4$$

$$-6$$

$$x + 6 = 4$$

$$-6$$

$$x = -6$$

## **Purple** sheet



Use elimination to solve each system of equations.

$\begin{array}{l} 1. \ x - y = 1 \\ x + y = -9 \end{array}$	2. p + q = -2 p - q = 8	<b>3.</b> $4x + y = 23$ 3x - y = 12
4. $2x + 5y = -3$ 2x + 2y = 6	5. $3x + 2y = -1$ 4x + 2y = -6	<b>6.</b> $5x + 3y = 22$ 5x - 2y = 2
7. $5x + 2y = 7$ -2x + 2y = -14	8. $3x - 9y = -12$ 3x - 15y = -6	$94c - 2d = -2 \\ 2c - 2d = -14$
$10. \ 2x - 6y = 6 \\ 2x + 3y = 24$	<b>11.</b> $7x + 2y = 2$ 7x - 2y = -30	<b>12.</b> $4.25x - 1.28y = -9.2$ x + 1.28y = 17.6

## White Sheet

Use elimination to solve each system of equations.		
1. $x + y = -9$	<b>2.</b> $3x + 2y = -9$	
5x - 2y = 32	x - y = -13	
<b>3.</b> $2x + 5y = 3$ -x + 3y = -7	4. 2x + y = 3 -4x - 4y = -8	
5. $4x - 2y = -14$	6. $2x + y = 0$	
3x - y = -8	5x + 3y = 2	
7. $5x + 3y = -10$	8. $2x + 3y = 14$	
3x + 5y = -6	3x - 4y = 4	
<b>9.</b> $2x - 3y = 21$	<b>10.</b> $3x + 2y = -26$	
5x - 2y = 25	4x - 5y = -4	
11. $3x - 6y = -3$ 2x + 4y = 30	12. 5x + 2y = -33x + 3y = 9	

## Classwork

Complete 12 problems on either sheet, or combined on both sheets.

Homework

Finish classwork