



Warm Up



1) Solve the following systems:

a) ① $2x - 3y = 16$

② $x + 2y = 1$ \Rightarrow ③ $x = -2y + 1$
 ↓ sub into ①

$2(x) - 3y = 16$
 $2(-2y + 1) - 3y = 16$

$4y + 2 - 3y = 16$

$-7y + 2 = 16$

$-7y = 14$

$y = -2$

↓ sub into ③

$x = -2y + 1$

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

$x = 4 + 1$

$x = 5$

(x, y)
 $(5, -2)$

b) $5x + 4y = -7$

$-(3x + 4y = -1)$

$5x + 4y = -7$
 $-3x - 4y = +1$

$2x = -6$

$x = -3$

↓ sub ①

$5(x) + 4y = -7$

$5(-3) + 4y = -7$

$-15 + 4y = -7$

$4y = 8$

$(-3, 2)$

$y = 2$

Math 10 (Numbers Relations & Functions)


Name _____


Elimination


HW Solutions


Date _____


Solve each system by elimination.


 1) $2x + 8y = 8$
 $-3x - 8y = -4$

 2) $-x + 4y = 7$
 $x + 4y = 25$

 3) $-9x + 8y = 15$
 $-9x + 6y = 27$

 4) $-x - 5y = -3$
 $-x + 3y = 13$

 5) $-5x + 2y = 9$
 $6x - 2y = -8$

 6) $5x + 5y = 30$
 $5x + 2y = 12$

7) $-10x + 8y = -28$
 $9x + 4y = 14$

8) $-6x + y = -15$
 $-12x - 3y = -15$

9) $-5x + 10y = -10$
 $-7x - 5y = -14$

10) $-5x + 10y = 5$
 $10x - 4y = 6$

11) $7x - 2y = 24$
 $3x + 9y = 30$

12) $-3x - 2y = 2$
 $-5x - 3y = 6$

13) $3x - 6y = 30$
 $-10x - 9y = -13$

14) $7x - 10y = 0$
 $-9x - 4y = 0$

15) $-10x + 7y = 12$
 $-3x + 6y = -12$

16) $-3x + 4y = 2$
 $-5x + 3y = 29$

17) $-10x - 6y = -14$
 $8x + 5y = 11$

18) $-3x - 2y = 8$
 $-8x - 7y = 18$

$$\begin{aligned} 1) \quad & 2x + 8y = 8 \\ & -3x - 8y = -4 \\ & \quad \quad (-4, 2) \end{aligned}$$

$$\begin{aligned} 2) \quad & -x + 4y = 7 \\ & x + 4y = 25 \\ & \quad \quad (9, 4) \end{aligned}$$

$$3) \begin{aligned} -9x + 8y &= 15 \\ (-9x + 6y &= 27) \\ \hline &(-7, -6) \end{aligned}$$

$$\begin{array}{r} -9x + 8y = 15 \\ 9x - 6y = -27 \\ \hline 2y = -12 \\ \frac{2y}{2} = \frac{-12}{2} \\ \hline y = -6 \end{array}$$

$$4) \begin{aligned} -x - 5y &= -3 \\ -x + 3y &= 13 \\ \hline &(-7, 2) \end{aligned}$$

①

$$-9x + 8y = 15$$

$$-9x + 8(-6) = 15$$

$$-9x - 48 = 15$$

$$\frac{-9x}{-9} = \frac{63}{-9}$$

$$x = -7$$

$$\begin{aligned} 5) \quad & -5x + 2y = 9 \\ & 6x - 2y = -8 \\ & \quad (1, 7) \end{aligned}$$

$$\begin{aligned} 6) \quad & 5x + 5y = 30 \\ & 5x + 2y = 12 \\ & \quad (0, 6) \end{aligned}$$

Elimination using Multiplication

Consider the system

$$\begin{array}{l} x + 2y = 6 \\ 3x + 3y = -6 \end{array}$$

How are they related?

What could we do to equation 1 to make the "x" equal?

answer



Elimination using Multiplication

Consider the system

$$\begin{array}{r} 3x + 6y = 18 \\ - (3x + 3y = -6) \end{array}$$

Now subtract the equations



Elimination using Multiplication

Consider the system

$$3x + 6y = 18$$

$$\underline{-3x - 3y = +6}$$

Now subtract the equations

Answer



Elimination using Multiplication

Consider the system

$$3x + 6y = 18$$

$$-3x - 3y = +6$$

$$\hline 3y = 24$$

$$y = 8$$

Now subtract the equations

Sub into equation 1 (original) or the above

$$x + 2y = 6$$

$$x + 2(8) = 6$$

$$x + 16 = 6$$

$$x = 6 - 16$$

$$x = -10$$

$$(-10, 6)$$

You Try

$$1) \quad \textcircled{1} x + 2y = 5 \xrightarrow{\textcircled{1} \times 2} \textcircled{3} 2x + 4y = 10$$

$$\textcircled{2} 2x + 6y = 12 \quad \textcircled{2} (2x + 6y = 12) \Rightarrow \textcircled{4} -2x - 6y = -12$$

change signs

$$\textcircled{3} - \textcircled{2}$$

ANS:

$$\textcircled{3} 2x + 4y = 10$$

$$\textcircled{4} -2x - 6y = -12$$

$$\frac{-2y = -2}{-2} \quad \frac{-2}{-2}$$

$$\boxed{y = +1}$$

↓ sub ①

$$x + 2y = 5$$

$$x + 2(1) = 5$$

$$x + 2 = 5 - 2$$

$$\boxed{x = 3}$$

$$(3, 1)$$

2)

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

$$\textcircled{2} (x - 4y = 16) \Rightarrow$$

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

$$-x + 4y = -16$$

$$\frac{6y}{6} = \frac{-12}{6}$$

$$y = -2$$

↓ sub $\textcircled{1}$

$$x + 2(y) = 4$$

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

$$x - 4 = 4 + 4$$

$$x = 8$$

$$x, y \\ (8, -2)$$

ANS:

Math 10 (Numbers Relations & Functions)

Name _____

Elimination **Same sheet as Yesterday**

Date _____

Solve each system by elimination.

1) $2x + 8y = 8$
 $-3x - 8y = -4$

2) $-x + 4y = 7$
 $x + 4y = 25$

3) $-9x + 8y = 15$
 $-9x + 6y = 27$

4) $-x - 5y = -3$
 $-x + 3y = 13$

5) $-5x + 2y = 9$
 $6x - 2y = -8$

6) $5x + 5y = 30$
 $5x + 2y = 12$

7) $-10x + 8y = -28$
 $9x + 4y = 14$

$\div 2$
 $-5x + 4y = -14$
 $-(9x + 4y = 14)$

8) $-6x + y = -15$
 $-12x - 3y = -15$

9) $-5x + 10y = -10$
 $-7x - 5y = -14$

10) $-5x + 10y = 5$
 $10x - 4y = 6$

11) $7x - 2y = 24$
 $3x + 9y = 30$

$-5x + 4y = -14$
 $-9x - 4y = -14$
 $-4x = -28$
 $x = 7$

12) $-3x - 2y = 2$
 $-5x - 3y = 6$

13) $3x - 6y = 30$
 $-10x - 9y = -13$

$x = 2$

14) $7x - 10y = 0$
 $-9x - 4y = 0$

15) $-10x + 7y = 12$
 $-3x + 6y = -12$

↓ sub ①

16) $-3x + 4y = 2$
 $-5x + 3y = 29$

17) $-10x - 6y = -14$
 $8x + 5y = 11$

$-10(2) + 8y = -28$
 $-20 + 8y = -28$
 $8y = -8$
 $y = -1$
 $(2, -1)$

18) $-3x - 2y = 8$
 $-8x - 7y = 18$

$$\begin{array}{l} 1) \\ \textcircled{1} 7x - 2y = 24 \\ \textcircled{2} 3x + 9y = 30 \xrightarrow{\div 3} \textcircled{3} 1x + 3y = 10 \xrightarrow{\times 7} - (7x + 21y = 70) \\ \textcircled{1} - \textcircled{3} \end{array}$$

$$\begin{array}{l} \textcircled{4} 7x - 2y = 24 \\ \quad -7x - 21y = -70 \\ \hline \end{array}$$

$$7) \quad -10x + 8y = -28$$

$$9x + 4y = 14$$

$$(2, -1)$$

$$8) \quad -6x + y = -15$$

$$-12x - 3y = -15$$

$$(2, -3)$$

$$\begin{aligned} 9) \quad & -5x + 10y = -10 \\ & -7x - 5y = -14 \\ & (2, 0) \end{aligned}$$

$$\begin{aligned} 10) \quad & -5x + 10y = 5 \\ & 10x - 4y = 6 \\ & (1, 1) \end{aligned}$$

$$\begin{aligned} 11) \quad & 7x - 2y = 24 \\ & 3x + 9y = 30 \\ & (4, 2) \end{aligned}$$

$$\begin{aligned} 12) \quad & -3x - 2y = 2 \\ & -5x - 3y = 6 \\ & (-6, 8) \end{aligned}$$

$$\begin{array}{l} 13) \quad 3x - 6y = 30 \\ \quad -10x - 9y = -13 \\ \quad (4, -3) \end{array}$$

$$\begin{array}{l} 14) \quad 7x - 10y = 0 \\ \quad -9x - 4y = 0 \\ \quad (0, 0) \end{array}$$

$$\begin{array}{l} 15) \quad -10x + 7y = 12 \\ \quad \quad -3x + 6y = -12 \\ \quad \quad (-4, -4) \end{array}$$

$$\begin{array}{l} 16) \quad -3x + 4y = 2 \\ \quad \quad -5x + 3y = 29 \\ \quad \quad (-10, -7) \end{array}$$

$$\begin{aligned} 17) \quad & -10x - 6y = -14 \\ & 8x + 5y = 11 \\ & (2, -1) \end{aligned}$$

$$\begin{aligned} 18) \quad & -3x - 2y = 8 \\ & -8x - 7y = 18 \\ & (-4, 2) \end{aligned}$$

Homework:

Math 10B

Name _____

System of Equations: Elimination (Add & Sub)

Date _____

Solve each system by elimination.

1) $8x - 8y = 0$
 $-5x + 8y = -3$

2) $6x - 4y = 6$
 $-8x + 4y = 0$

3) $-3x + 8y = -15$
 $9x - 8y = -3$

4) $x + 3y = 18$
 $3x - 3y = -6$

5) $-x + 5y = -28$
 $x + 3y = -28$

6) $-5x + 3y = 10$
 $5x - 5y = 10$

7) $-4x + 5y = 25$
 $-4x + 6y = 22$

8) $-3x + 5y = 12$
 $-5x + 5y = 0$

11) $5x - y = 19$
 $-9x - y = -9$

12) $-2x + y = 0$
 $-6x + y = 20$

13) $10x = 18 + 8y$
 $-8y = -5x - 27$

14) $8y + 13 = 3x$
 $-8y = 9x + 25$

15) $4 + x = -2y$
 $16 + 8y - x = 0$

16) $-12 + 8x = 6y$
 $-5y - 10 = 4x$

Homework:

Math 10B

Name _____

System of Equations: Elimination (Add & Sub)

Date _____

Solve each system by elimination.

$$\begin{aligned} 1) \quad & 8x - 8y = 0 \\ & -5x + 8y = -3 \end{aligned}$$

$$\begin{aligned} 2) \quad & 6x - 4y = 6 \\ & -8x + 4y = 0 \end{aligned}$$

$$(-3, -6) \text{ add}$$

$$\begin{aligned} 3) \quad & -3x + 8y = -15 \\ & 9x - 8y = -3 \end{aligned}$$

$$\begin{aligned} 4) \quad & x + 3y = 18 \\ & 3x - 3y = -6 \end{aligned}$$

$$(3, 5) \text{ add}$$

$$\begin{aligned} 5) \quad & -x + 5y = -28 \\ & x + 3y = -28 \end{aligned}$$

$$\begin{aligned} 6) \quad & -5x + 3y = 10 \\ & 5x - 5y = 10 \end{aligned}$$

$$(-8, -10) \text{ add}$$

$$\begin{aligned} 7) \quad & -4x + 5y = 25 \\ & -4x + 6y = 22 \end{aligned}$$

$$\begin{aligned} 8) \quad & -3x + 5y = 12 \\ & -5x + 5y = 0 \end{aligned}$$

$$(6, 6) \text{ sub}$$

$$\begin{aligned} 9) \quad & -4x - 7y = -15 \\ & -4x - 9y = -17 \end{aligned}$$

$$\begin{aligned} 10) \quad & -5x - 3y = 7 \\ & -2x - 3y = -8 \end{aligned}$$

$$(-5, 6) \text{ sub}$$

$$\begin{aligned} 11) \quad & 5x - y = 19 \\ & -9x - y = -9 \end{aligned}$$

$$\begin{aligned} 12) \quad & -2x + y = 0 \\ & -6x + y = 20 \end{aligned}$$

$$(-5, -10) \text{ sub}$$

$$\begin{aligned} 13) \quad & 10x = 18 + 8y \\ & -8y = -5x - 27 \end{aligned}$$

$$\begin{aligned} 14) \quad & 8y + 13 = 3x \\ & -8y = 9x + 25 \end{aligned}$$

$$(-1, -2) \text{ sub}$$

~~$$\begin{aligned} 15) \quad & 4 + y = -2y \\ & 16 + 8y - x = 0 \end{aligned}$$~~

~~$$\begin{aligned} 16) \quad & -12 + 8x = 6y \\ & -5y - 16 = 4x \end{aligned}$$~~

$$(0, -2)$$

$$\begin{array}{r} 2) \ 6x - 4y = 6 \quad \textcircled{1} \\ + \ -8x + 4y = 0 \quad \textcircled{2} \\ \hline \end{array}$$

$$-2x + 0 = 6$$

$$-2x = 6$$

$$x = \frac{6}{-2}$$

$$\boxed{x = -3}$$

$$6x - 4y = 6$$

$$6(-3) - 4y = 6$$

$$-18 - 4y = 6$$

$$-4y = 6 + 18$$

$$-4y = 24$$

$$y = \frac{24}{-4}$$

$$\boxed{y = -6}$$

$$\begin{array}{r} 2) \quad 6x - 4y = 6 \quad \textcircled{1} \\ + \quad -8x + 4y = 0 \quad \textcircled{2} \\ \hline \end{array}$$

$$-2x + 0 = 6$$

$$-2x = 6$$

$$x = \frac{6}{-2}$$

$$\boxed{x = -3}$$

$$6x - 4y = 6$$

$$6(-3) - 4y = 6$$

$$-18 - 4y = 6$$

$$-4y = 6 + 18$$

$$-4y = 24$$

$$y = \frac{24}{-4}$$

$$\boxed{y = -6}$$

$$8) \quad -3x + 5y = 12 \quad \textcircled{1}$$

$$-(-5x + 5y = 0) \quad \textcircled{2}$$

$$(-3x + 5x) + 0 = 12 - 0$$

$$2x = 12$$

$$x = \frac{12}{2}$$

$$\boxed{x = 6}$$

$$-3x + 5y = 12$$

$$-3(6) + 5y = 12$$

$$-18 + 5y = 12$$

$$5y = 12 + 18$$

$$5y = 30$$

$$\boxed{y = 6}$$

$$\begin{array}{r} 8) \quad -3x + 5y = 12 \\ - \quad (-5x + 5y = 0) \\ \hline \end{array}$$

$$\begin{array}{r} 8) \quad -3x + 5y = 12 \\ + \quad 5x - 5y = 0 \\ \hline 2x = 12 \end{array}$$

$$\boxed{x = 6}$$

$$10) \begin{array}{r} -5x - 3y = 7 \\ -(-2x - 3y = -8) \end{array}$$

$$(-5x + 2x) - 3y + 3y = 7 + 8$$

$$-3x = 15$$

$$x = \frac{15}{-3}$$

$$\boxed{x = -5}$$

$$-5x - 3y = 7$$

$$-5(-5) - 3y = 7$$

$$25 - 3y = 7$$

$$-3y = 7 - 25$$

$$-3y = -18$$

$$y = \frac{-18}{-3}$$

$$\boxed{y = +6}$$

