Warm Up

Solve the following system of equations:

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

Subtracting negatives may not be your favorite thing to do. You can make things easier on yourself by rewriting one equation in an equivalent form so you can add.

$-1\,(x - y = 3)$ ← exactly the same just looks different

$$7x - y = -3$$
$$+\ -x + y = -3$$

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

$$x = -1$$

$$x - y = 3$$
$$-1 - y = 3$$
$$+1 \quad +1$$

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

$$y = -4$$

$(-1, -4)$

Homework Questions?

7-3 Practice

Elimination Using Addition and Subtraction

Use elimination to solve each system of equations.

1. $x - y = 1$
   $x + y = -9$
   (−4, −5)

2. $p + q = -2$
   $p - q = 8$
   (3, −5)

3. $4x + y = 23$
   $3x - y = 12$
   (5, 3)

4. $2x + 5y = -3$
   $2x + 2y = 6$
   (6, −3)

5. $3x + 2y = -1$
   $4x + 2y = -6$
   (−5, 7)

6. $5x + 3y = 22$
   $5x - 2y = 2$
   (2, 4)

7. $5x + 2y = 7$
   $-2x + 2y = -14$
   (3, −4)

8. $3x - 9y = -12$
   $3x - 15y = -6$
   (−7, −1)

9. $-4c - 2d = -2$
   $2c - 2d = -14$
   (−2, 5)

10. $2x - 6y = 6$
    $2x + 3y = 24$
    (9, 2)

11. $7x + 2y = 2$
    $7x - 2y = -30$
    (−2, 8)

12. $4.25x - 1.28y = -9.2$
    $x + 1.28y = 17.6$
    (1.6, 12.5)

#12

$$\begin{array}{r} 4.25x - 1.28y = -9.2 \\ +\quad x + 1.28y = 17.6 \\ \hline 5.25x = 8.4 \end{array}$$

$$\frac{5.25x}{5.25} = \frac{8.4}{5.25}$$

$$x = 1.6$$

$x + 1.28y = 17.6$ (1.6, 12.5)

$1.6 + 1.28y = 17.6$

$-1.6 \qquad -1.6$

$$1.28y = 16$$

$$\frac{1.28y}{1.28} = \frac{16}{1.28}$$

$$y = 12.5$$

Use elimination to solve each system of equations.

2 [**1.** $x + y = -9$]
$5x - 2y = 32$

$2x+2y=-18$
$+\ 5x-2y=32$
$7x=14$
$\frac{7x}{7}=\frac{14}{7}$
$x=2$

2. $3x + 2y = -9$
$x - y = -13$

3. $2x + 5y = 3$
$-x + 3y = -7$

4. $2x + y = 3$
$-4x - 4y = -8$

5. $4x - 2y = -14$
$3x - y = -8$

6. $2x + y = 0$
$5x + 3y = 2$

7. $5x + 3y = -10$
$3x + 5y = -6$

8. $2x + 3y = 14$
$3x - 4y = 4$

9. $2x - 3y = 21$
$5x - 2y = 25$

10. $3x + 2y = -26$
$4x - 5y = -4$

11. $3x - 6y = -3$
$2x + 4y = 30$

3 [**12.** $5x + 2y = -3$] $15x+6y=-9$
-2 [$3x + 3y = 9$] $-6x-6y=-18$

You need to multiply BOTH equations so you can use combination/elimination.

3 2 [$5x + 2y = -3$]
5 [$3x + 3y = 9$]

Another way to multiply:

This time you will eliminate "x"

$15x+6y=-3$
$15x+15y=45$

2. $3x + 2y = $ [illegible]
$x - y = -13$

4. $2x + y = 3$
$-4x - 4y = -8$

6. $2x + y = 0$
$5x + 3y = 2$

8. $2x + 3y = 14$
$3x - 4y = 4$

10. $3x + 2y = -26$
$4x - 5y = -4$

12. $5x + 2y = -3$
$3x + 3y = 9$

$2x + 5y = 3$
$+\ -2x + 6y = -14$

$11y = -11$
$\frac{11y}{11} = \frac{-11}{11}$
$y = -1$

$3[\quad] \ 15x + 6y = -3$
$5[\quad] \ 15x + 15y = 45$

$3[5x + 2y = -3] \ 15x + 6y = -9$
$2[3x + 3y = 9] \ 6x + 6y = 18$

Pick a Practice Sheet

Substitution

DID YOU HEAR ABOUT the antelope who was getting dressed when he was trampled by a herd of buffalo?

Well,	1	2	3	4	5	6
7	8	9	10	11	12	13

Solve each system of equations by the substitution method. Write the word next to the correct answer in the box containing the exercise number.

1. $y = 3x$
$5x + 2y = 44$

2. $x = 5y - 1$
$x + 2y = 13$

3. $y = 2x + 7$
$3x - y = -9$

4. $-2x + 3y = 11$
$x = 4y - 3$

5. $y = 6x - 5$
$y = -x + 9$

6. $-3x + y = 7$
$5x + 2y = 3$

7. $x - y = 11$
$3x + 10y = -6$

8. $-4x + y = 4$
$2x + 2y = 13$

9. $x + y = 1$
$5x - 4y = -7$

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

11. $x + 9y = -1$
$2x + 4y = 5$

12. $-5x + y = 35$
$3x + 2y = -21$

13. A math test is worth 100 points and has 30 problems. Each problem is worth either 3 points or 4 points. How many 4-point problems are there?

- $(-2, 2)$ OFTEN
- $\left(\frac{1}{2}, -3\right)$ RANGE
- $(9, 2)$ FAR
- $(-7, 0)$ STAMPED
- $(2, 7)$ KNOW
- $\left(-\frac{1}{3}, \frac{4}{3}\right)$ FIRST
- $(4, 12)$ AS
- $(-1, -3)$ HOME
- $(8, -3)$ WAS
- $\left(\frac{7}{2}, -\frac{1}{2}\right)$ DRESSED
- 14 WESTERN
- $(-7, -1)$ WE
- $\left(-\frac{1}{3}, -1\right)$ BIGGEST
- $(-1, 4)$ THIS
- 10 ANTELOPE
- $(-4, -3)$ SELF
- $(-2, 3)$ AS
- $(2, 1)$ COWBOYS
- $\left(\frac{1}{2}, 6\right)$ THE
- $\left(-7, -\frac{1}{2}\right)$ DEFENSE

Combination/Elimination with + / -

What Kind of Shoes Does a Frog Wear?

Solve each system of equations by the addition method. (You may first have to multiply both sides of one equation by −1.) Find your answer below and cross out the letter above it. When you finish, the answer to the title question will remain.

(1) $5x - 2y = 4$
$x + 2y = 8$

(2) $-3x + 2y = 11$
$3x - 4y = -19$

(3) $3x + y = 13$
$x + y = 3$

(4) $6x - 2y = 10$
$x - 2y = -5$

(5) $5x + y = 2$
$5x - 3y = 14$

(6) $7x - 4y = -10$
$4y = x - 2$

(7) $x = 5 - 9y$
$4x + 9y = -7$

(8) $3x = 5y - 9$
$2y = 3x + 3$

(9) $x + 2y = -2$
$4x + 2y = -17$

(10) $-6x - 5y = 20$
$-y = 6x + 4$

(11) $-3x + y = -2$
$-2 = 7x - y$

(12) $10x - 5 = 3y$
$2x - 3y = 1$

S	H	O	L	D	P	R	E	S	A	N	T	I	O	E	N	A	I	D	R
$(0, -4)$	$(\frac{1}{2}, 0)$	$(3, 7)$	$(\frac{1}{3}, 2)$	$(-2, -1)$	$(-5, 3)$	$(3, 4)$	$(\frac{1}{2}, 2)$	$(2, 3)$	$(-4, 1)$	$(2, -4)$	$(-2, 2)$	$(-1, -5)$	$(-1, 6)$	$(-1, 4)$	$(-5, \frac{3}{2})$	$(5, -3)$	$(5, -2)$	$(-5, 4)$	$(1, -3)$

OBJECTIVE 6–d: To solve systems of equations by the addition method (multiplication by −1 may be required).

Combination/Elimination with multiplication followed by + / -

What Does Cate Often Call Her Twin Sister?

Solve the system of equations using multiplication with the addition method. Then cross out the letter next to the correct answer. When you finish, the answer to the title question will remain.

A	72, 28
D	(5, 0)
O	(−2, 1)
R	(4, 3)
U	(3, −6)
P	(−2, −2)
U	(0, −4)
B	(−1, −3)
L	(5, −3)
E	(5, −2)
I	(0, 2)
S	65, 35
C	(−1, 1)
E	(1, 4)
R	(−2, −5)
A	(4, 0)
T	56, 44
W	(2, −1)
O	(−2, 4)
I	(2, −3)
E	(1, −5)
N	(3, 1)

1. $3x + 2y = 11$
   $7x - y = 3$

2. $3x - 4y = 18$
   $x + 3y = -7$

3. $5x + 2y = -8$
   $9x - 4y = -22$

4. $x - 5y = 15$
   $4x - 3y = 26$

5. $2x + 5y = 11$
   $-3x + 8y = -1$

6. $7x - 3y = 2$
   $5x + 4y = -17$

7. $4x - 5y = -28$
   $-9x - 2y = 10$

8. $2x + 3y = 10$
   $3x - 10y = 15$

9. $-7x + 4y = -6$
   $2x - 5y = 21$

10. $8x + 3y = -12$
    $6x + 5y = -20$

11. $-4x - 9y = 1$
    $-x + 2y = -4$

12. $5x - 12y = -16$
    $-3x + 4y = 0$

13. An algebra teacher drove by a farmyard full of chickens and pigs. The teacher happened to notice that there were a total of 100 heads and 270 legs. How many chickens were there? How many pigs were there?

Homework

Finish classwork