Name: _____

Sec. 7.4: Solve Linear Systems by Multiplying First

If a linear system does not have a variable with coefficients in two equations that are either _____ or exact _____, we can still use elimination to solve the system.

- If the coefficient of a variable in one equation is a _____ of the coefficient of that same variable in the other equation, we can _____ one equation and then add or subtract equations to eliminate that variable. (E.g., if one equation contains the term 3x and the other contains 12x, we can multiply the first equation by 4 or -4 to match coefficients.)
- If we cannot match coefficients by multiplying one equation, we can always multiply _____ equations, just as we would in finding a least common multiple. (E.g., if one equation contains 3x and the other contains 5x, we could multiply the first equation by 5 and the second equation by 3 or -3, giving us 15x in the first equation and either 15x or -15x in the second equation.

Examples

Solve each system using elimination.

1. $2x + 2y = -21$
   $5x + 6y = -6$

2. $7x + 14y = -21$
   $x - 7y = -21$

3. $8x - 7y = 12$
   $-6x + 2y = -22$

4. Two high schools took a group of students on a field trip to an amusement park. The students traveled in buses and vans, with each bus holding the same number of students, and each van holding the same number of students. North High School used 3 vans and 5 buses to transport 222 students. South High School used 7 vans and 2 buses to transport 141 students. Find the number of students in each van and in each bus.

Algebra 1 Name_____

Sec. 7.4 Practice Problems

Solve each system by elimination.

1) $-4x - 9y = -4$
$-x - 2y = -2$

2) $5x + 6y = -18$
$15x - 5y = 15$

3) $20x + 10y = -10$
$-10x - 2y = 8$

4) $-x + 7y = 0$
$-4x + 6y = -22$

5) $-10x + 7y = -12$
$5x + y = 24$

6) $3x + 8y = 15$
$-2x - 16y = -10$

7) $7x - 9y = -11$
$10x - 18y = 10$

8) $x - 15y = -22$
$-4x + 5y = -22$

9) $-4x + 3y = 24$
$5x - 4y = -30$

10) $-7x - 4y = 23$
$-2x - 5y = -5$

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

12) $2x + 3y = -23$
$7x - 4y = -8$

13) $-4x - 6y = 6$
$-3y = -2x - 9$

14) $-5x = -20 + 6y$
$2x - 8 - 12y = 0$

15) Nicole and Heather each improved their yards by planting daylilies and ivy. They bought their supplies from th same store. Nicole spent $108 on 12 daylilies and 6 pots of ivy. Heather spent $38 on 4 daylilies and 3 pots of ivy. Find the cost of one daylily and the cost of one pot of ivy.

16) Danielle and Totsakan each improved their yards by planting daylilies and geraniums. They bought their supplies from the same store. Danielle spent $95 on 7 daylilies and 4 geraniums. Totsakan spent $124 on 4 daylilies and 11 geraniums. What is the cost of one daylily and the cost of one geranium?

Answers to Sec. 7.4 Practice Problems

1) $(10, -4)$
2) $(0, -3)$
3) $(-1, 1)$
4) $(7, 1)$
5) $(4, 4)$
6) $(5, 0)$
7) $(-8, -5)$
8) $(8, 2)$
9) $(-6, 0)$
10) $(-5, 3)$
11) $(-5, -6)$
12) $(-4, -5)$
13) $(-3, 1)$
14) $(4, 0)$
15) daylily: \$8, pot of ivy: \$2
16) daylily: \$9, geranium: \$8