Name: _____

Unit 1

Systems of Linear Equations

WORKBOOK

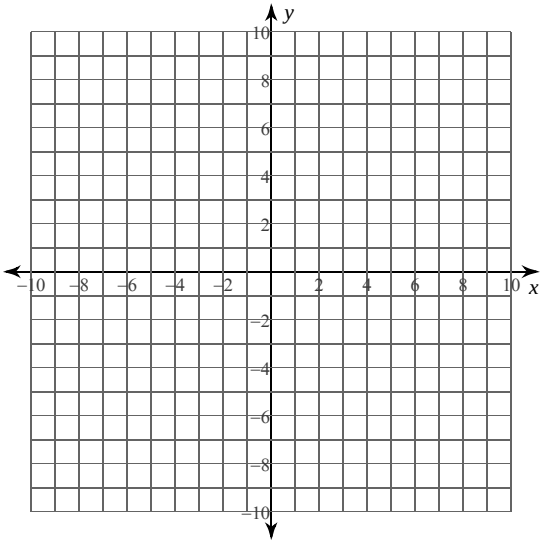
Learning Goals. We are learning to:

- create the graphs which represent given linear equations;
- determine a solution to a linear system graphically;
- explain what the solution to a linear system means;
- determine a solution to a linear system algebraically by substitution;
- determine a solution to a linear system algebraically by elimination; and
- create and solve a linear system which models a given situation (word problem)

Solve each system by graphing.

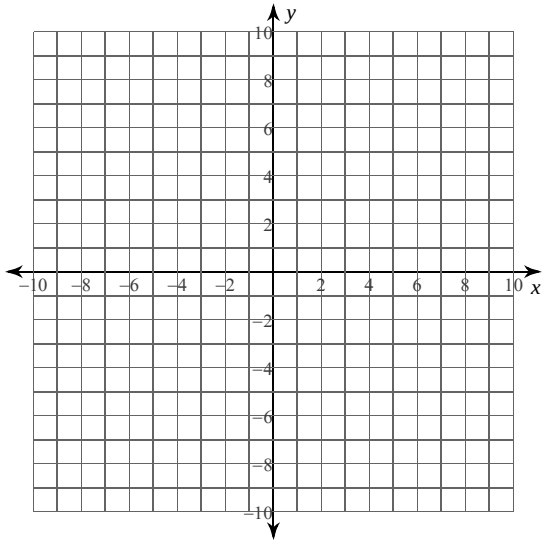
1.) $y = -\frac{1}{8}x + 3$

$y = -\frac{1}{8}x - 7$



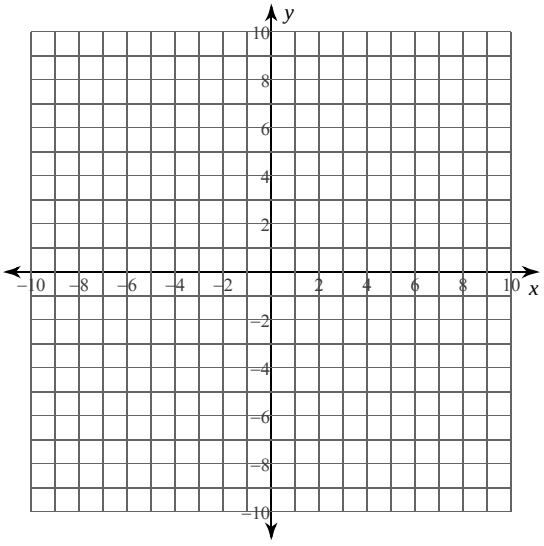
2.) $y = \frac{13}{4}x + 4$

$y = \frac{3}{4}x - 6$



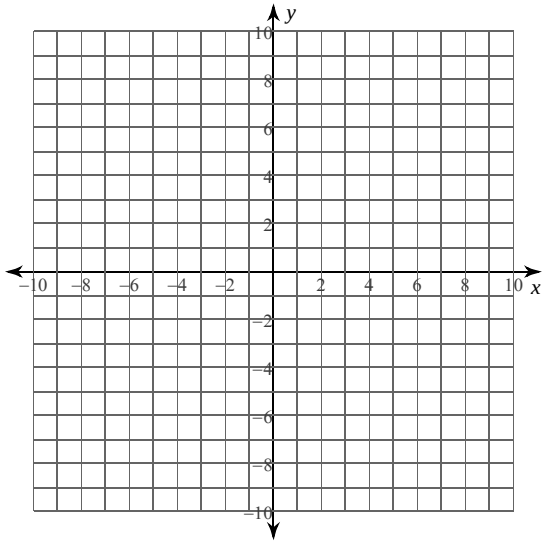
3.) $y = -\frac{3}{5}x + 3$

$y = -\frac{12}{5}x - 6$

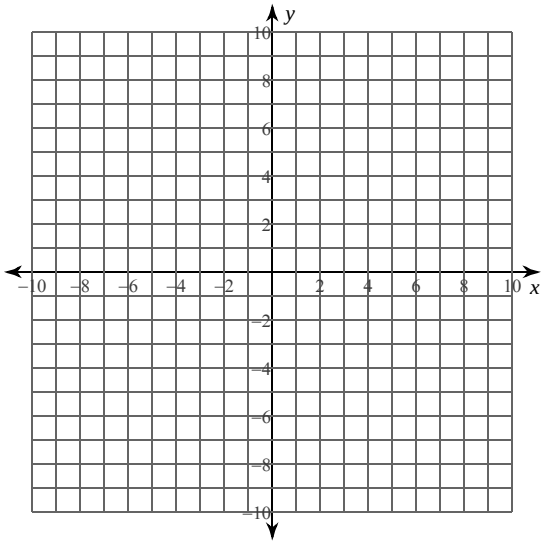


4.) $y = -\frac{4}{3}x - 9$

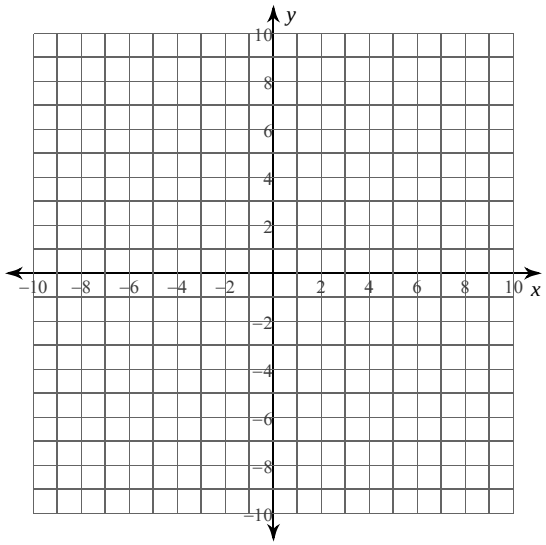
$x = -9$



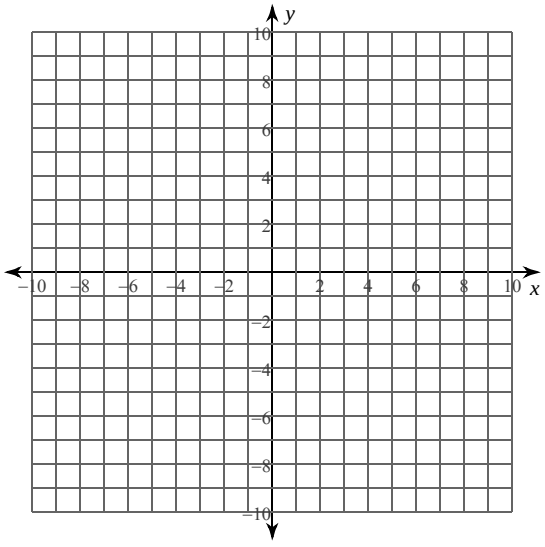
5.) $y = 3x + 4$
$y = 3x + 2$



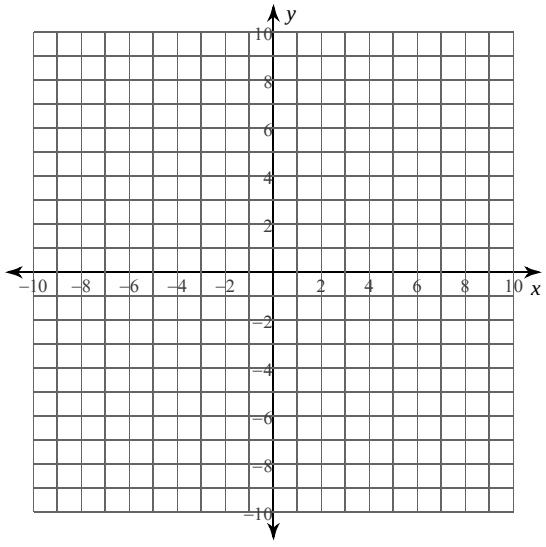
6.) $y = -2x + 7$
$y = \frac{2}{3}x - 1$



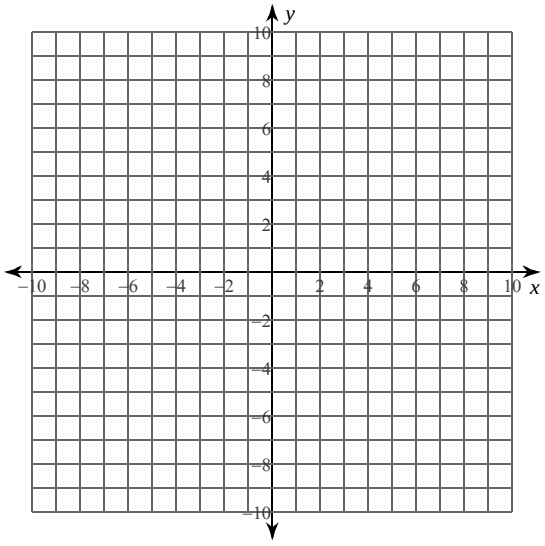
7.) $4x - 3y = -27$
$5x + 9y = -72$



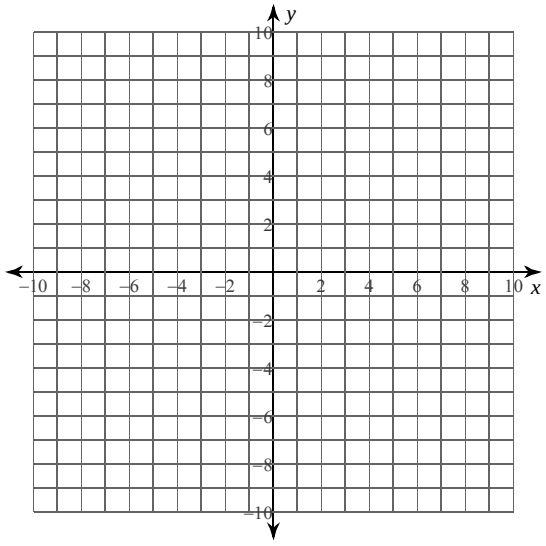
8.) $4x - 9y = 45$
$16x - 9y = -63$



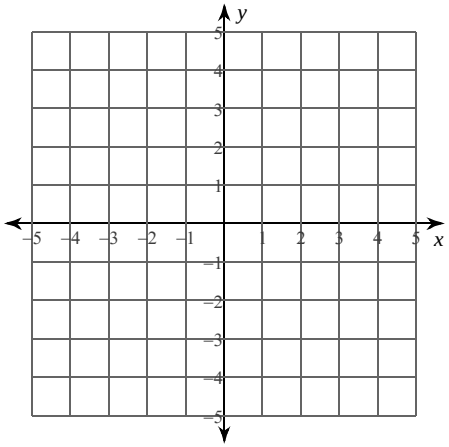
9.) $x - 2y = 4$
$x - 2y = 14$



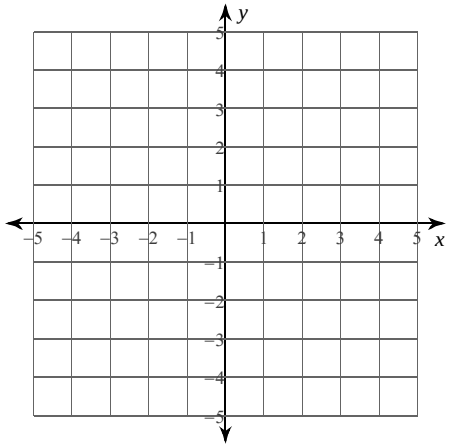
10.) $9x + 7y = 28$
$3x - 7y = 56$



11.) $-15x = 18 - 9y$
$12 = -3y - x$



12.) $y + 4 = -4x$
$x - 2 = -y$



Solve each system by substitution.

13.) $y = -19x + 57$
$y = 10x - 30$

14.) $y = 11x - 48$
$y = -7x + 42$

15.) $y = 15x - 20$
$y = 12x - 14$

16.) $y = -8x - 38$
$y = 2$

17.) $-15x - 4y = -30$
$x - 16y = 2$

18.) $x - 11y = 54$
$-11x + 19y = 18$

19.) $x + 14y = 2$
$20x - 2y = 40$

20.) $y = -7$
$12x + 8y = -8$

21.) $x + 4y = -32$
$19x - 3y = 24$

22.) $y = 0$
$-3x - 5y = 57$

23.) $-9x + 11y = 8$
$y = -14$

24.) $-14x - 9y = -33$
$-9x - 11y = -16$

25.) $-14x + 15y = 33$
$5x - 3y = 0$

26.) $-3x + 13y = 4$
$y = -2$

27.) $y = -14$
$20x - 9y = -34$

28.) $3x - 10y = -22$
$10x - 18y = 34$

Solve each system by elimination.

29.) $-5x + 6y = 8$
$5x - y = -18$

30.) $5x + 7y = -6$
$-5x + y = 22$

31.) $2x - y = 9$
$-2x - 9y = -19$

32.) $10x - 3y = 27$
$x - 3y = 0$

33.) $-4x - 3y = -24$
$-4x + 5y = -24$

34.) $x - 7y + 19 = 0$
$y + 3 = -x$

35.) $x - \frac{1}{5}y = \frac{8}{5}$
$0 = 16 - 5x + 2y$

36.) $8x + 9y = 30$
$-3x - 18y = 18$

37.) $4x + 8y = 28$
$3x - 16y = -1$

38.) $11x + 4y = 12$
$-x - 2y = 12$

39.) $-5x - 3y = -4$
$-10x - 7y = -1$

40.) $27x - 54y = 0$
$18x - 36y = 0$

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Lesson: Creating Linear Systems - Word Problems

1) Sarawong and Norachai each improved their yards by planting hostas and geraniums. They bought their supplies from the same store. Sarawong spent $522 on 49 hostas and 26 geraniums. Norachai spent $480 on 30 hostas and 48 geraniums. What is the cost of one hosta and the cost of one geranium?

2) Cody wants to make 10 gal. of a 46% saline solution by mixing together a 70% saline solution and a 10% saline solution. How much of each solution must he use?

3) The senior classes at High School A and High School B planned separate trips to the county fair. The senior class at High School A rented and filled 7 vans and 17 buses with 535 students. High School B rented and filled 13 vans and 16 buses with 542 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?

4) The school that Ted goes to is selling tickets to the annual talent show. On the first day of ticket sales the school sold 9 adult tickets and 5 student tickets for a total of $136. The school took in $239 on the second day by selling 18 adult tickets and 7 student tickets. Find the price of an adult ticket and the price of a student ticket.

5) Premium salad mix which costs $3.70/kg is made by combining arugula which costs $3.30/kg with spinach which costs $5.90/kg. Find the number of kg of arugula and spinach required to make 3.9 kg of premium salad mix.

6) Alberto asked you to make 8 gal. of fruit punch that contains 50% fruit juice by mixing together some amount of Brand A fruit punch and some amount of Brand B fruit punch. Brand A contains 55% fruit juice and Brand B contains 35% fruit juice. How much of each do you need?

7) Daniel and Bill are selling flower bulbs for a school fundraiser. Customers can buy bags of windflower bulbs and bags of daffodil bulbs. Daniel sold 9 bags of windflower bulbs and 10 bags of daffodil bulbs for a total of $323. Bill sold 13 bags of windflower bulbs and 6 bags of daffodil bulbs for a total of $323. Find the cost each of one bag of windflower bulbs and one bag of daffodil bulbs.

8) Baking flour which costs $5/kg is made by combining bleached flour which costs $6/kg with unbleached flour which costs $3/kg. Find the number of kg of bleached flour and unbleached flour required to make 24 kg of baking flour.

More Practice: Solving systems using Elimination

State the variables. Create Equations. Solve the system.

The sum of two numbers is 172. The first is 8 less than 4 times the second. Find the first number.

Trevon and Jose are selling pies for a school fundraiser. Customers can buy cherry pies and lemon meringue pies. Trevon sold 8 cherry pies and 8 lemon meringue pies for a total of $152. Jose sold 4 cherry pies and 6 lemon meringue pies for a total of $100. What is the cost each of one cherry pie and one lemon meringue pie?

The school that Shreya goes to is selling tickets to a fall musical. On the first day of ticket sales the school sold 9 senior citizen tickets and 1 child ticket for a total of $122. The school took in $113 on the second day by selling 6 senior citizen tickets and 7 child tickets. Find the price of a senior citizen ticket and the price of a child ticket.

Fruit salad which costs $5/lb is made by combining sliced peaches which cost $3/lb with sliced bananas which cost $9/lb. Find the number of lbs of sliced peaches and sliced bananas required to make 15lb of fruit salad.

More Practice: Solving systems using Substitution

State the variables. Create Equations. Solve the system.

Jennifer and Adam are selling pies for a school fundraiser. Customers can buy apple pies and pumpkin pies. Jennifer sold 1 apple pie and 5 pumpkin pies for a total of $120. Adam sold 14 apple pies and 11 pumpkin pies for a total of $500. Find the cost each of one apple pie and one pumpkin pie.

Joe and Kathryn each improved their yards by planting hostas and geraniums. They bought their supplies from the same store. Joe spent $148 on 11 hostas and 4 geraniums. Kathryn spent $116 on 6 hostas and 11 geraniums. Find the cost of one hosta and the cost of one geranium.

One type of granola is 30% fruit and another type is 15% fruit. What mass of each type of granola should be mixed to make 600 g of granola that is 21% fruit?

A chemistry teacher needs to make 10L of 42% sulphuric acid solution. The acid solutions available are 30% sulphuric acid and 50% sulphuric acid, by volume. How many litres of each solution must be mixed to make the 42% solution?