

Chapter 6  
Systems of Equations  
and Inequalities

- solving systems in two variables by graphing, substitution and elimination
- solving linear inequalities

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Section 6-1  
Solving Systems  
by Graphing

- Students will be able to:
- solve systems of equations by graphing
  - analyze special systems

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Who will win the race?

by Graphing

Objectives To solve systems of equations by graphing  
To analyze special systems

Getting Ready!

Two professional downhill skiers are racing at the speeds shown in the diagram. Skier 1 starts 5 s before Skier 2. The course is 5000 ft long. Will Skier 2 pass Skier 1? How do you know?

Skier 1 100 ft/s  
Skier 2 110 ft/s

You can model the problem in the Solve It with two linear equations. Two or more linear equations form a **system of linear equations**. Any ordered pair that makes all of the equations in a system true is a **solution of a system of linear equations**.

**Essential Understanding** You can use systems of linear equations to model

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Two or more linear equations form a system of equations.

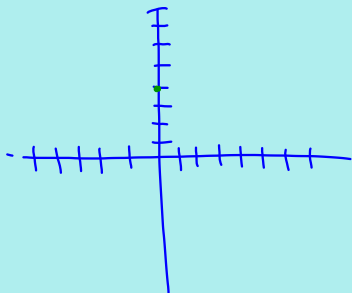
-solution to the system is the ordered pair that makes all of the equations true.

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If the system is as follows, how could we find the ordered pair that made both equations true?

$$y = 2x + 4$$

$$y = x + 2$$



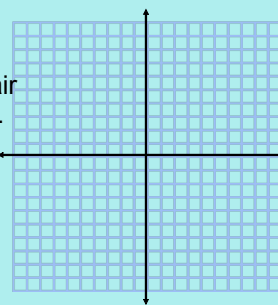
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By graphing the two lines, we can find the ordered pair that makes them both true.

It is the intersection point.

$$y = 2x + 4$$

$$y = x + 2$$



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One satellite radio service charges \$10 per month plus an activation fee of \$20. A second service charges \$11 per month plus an activation fee of \$15. In what month was the cost of service the same?

$$C = 10x + 20$$

$$C = 11x + 15$$

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How many solutions? 1  
Classify: Consistent, Independent

How many solutions?  $\emptyset$   
Classify: Inconsistent

How many solutions? *inf. many*  
Classify: Consistent, Dependent

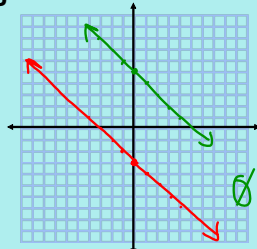
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Solve by graphing:

~~$$3 + y = x - 3$$~~  

$$x + y = 5$$

$$y = -x + 5$$



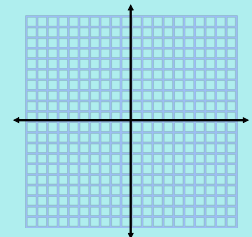
Same slope, diff y-int  
 $\emptyset$

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Solve by graphing:

$$y = 3x - 3$$
~~$$3y = 9x - 9$$~~  

$$y = 3x - 3$$



Same line  
*inf. many sols.*

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How can the original equations tell you how many solutions the system will have?

Hwk: pg. 367 - 368

#10 - 18(4th), 20,  
22-30(4th), 32, 34,  
35 - 38 all, 40

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