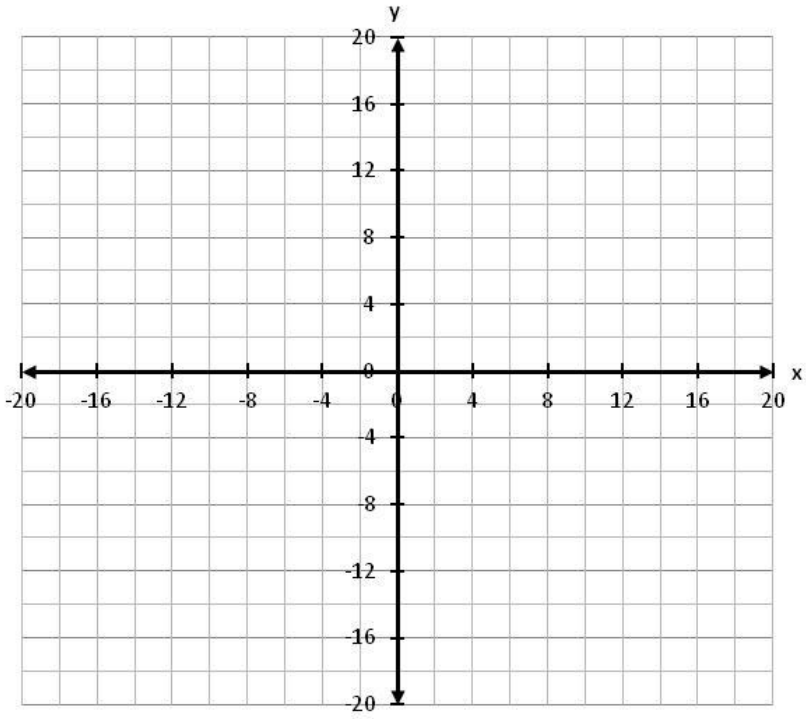
Equivalent Linear Systems

Learning Goal

- Compare solutions for equivalent systems of linear equations.

Minds on . . .

- Let's solve the linear system $x + 2y = 10$ and $4x - y = -14$ by graphing.



More minds on . . .

- Just for fun, add the two equations and graph the new line. What do you notice?
- Subtract the two equations and graph the new line. What do you notice?
- Try something else, multiply the first equation by 2. What do you notice when you try to graph it?

Big Ideas

- Equivalent Systems of Linear Equations
  - Two or more systems of linear equations that have the same solution.

More Big Ideas

- You can create an equivalent system of linear equations by:
  - Adding or subtracting the equations in a linear system.
  - Multiplying one or both equations of a system by a constant other than 0.

Example

- Consider the linear system:

  $x - 3y = 2$

  $2x + y = -5$

- Add and subtract the equations to create an equivalent linear system.
- Multiply each equation in the system by a different constant to create another equivalent linear system.

Solution

$x - 3y = 2$

$2x + y = -5$

$x - 3y = 2$

$2x + y = -5$

$x - 3y = 2$

$2x + y = -5$

$x - 3y = 2$

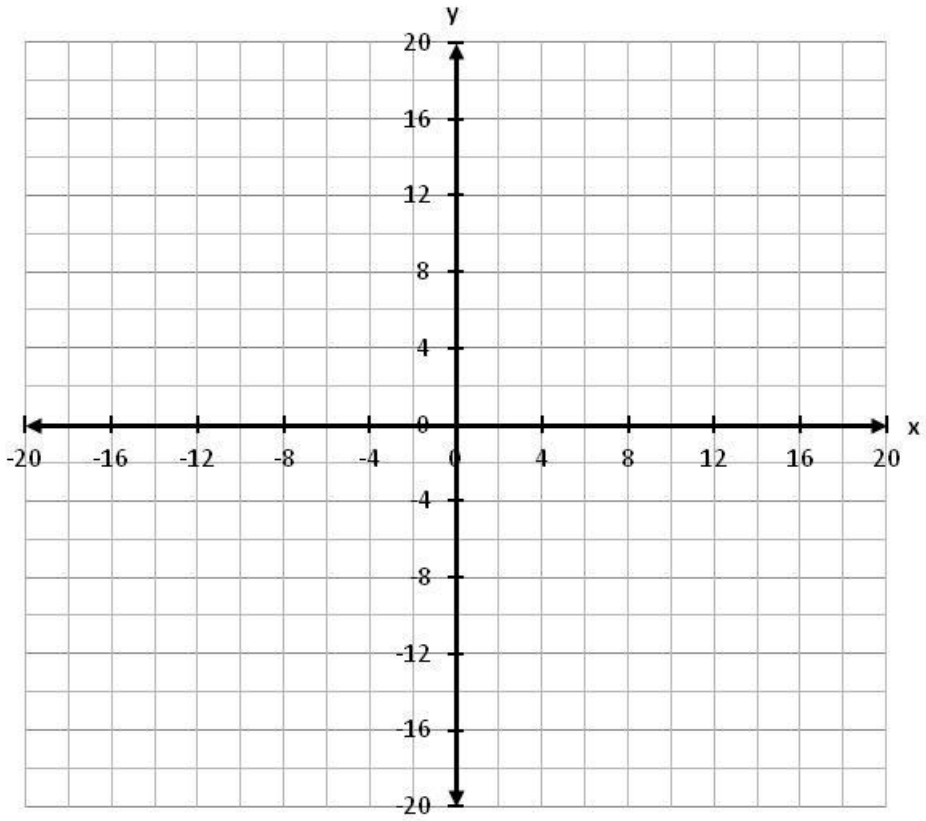
$2x + y = -5$

Consolidation

- A teacher claims that these systems of linear equations are equivalent. Is she correct?

System A	System B	System C
$3x - 2y = 2$ $-10x + 3y = 8$	$-7x + y = 10$ $13x - 5y = -6$	$x = -2$ $y = -4$

More Consolidation



Reinforcement

- Pages 46 – 48
  - #3, 4, 6, 8a