

1.5 Investigating Ways Lines Can Intersect.

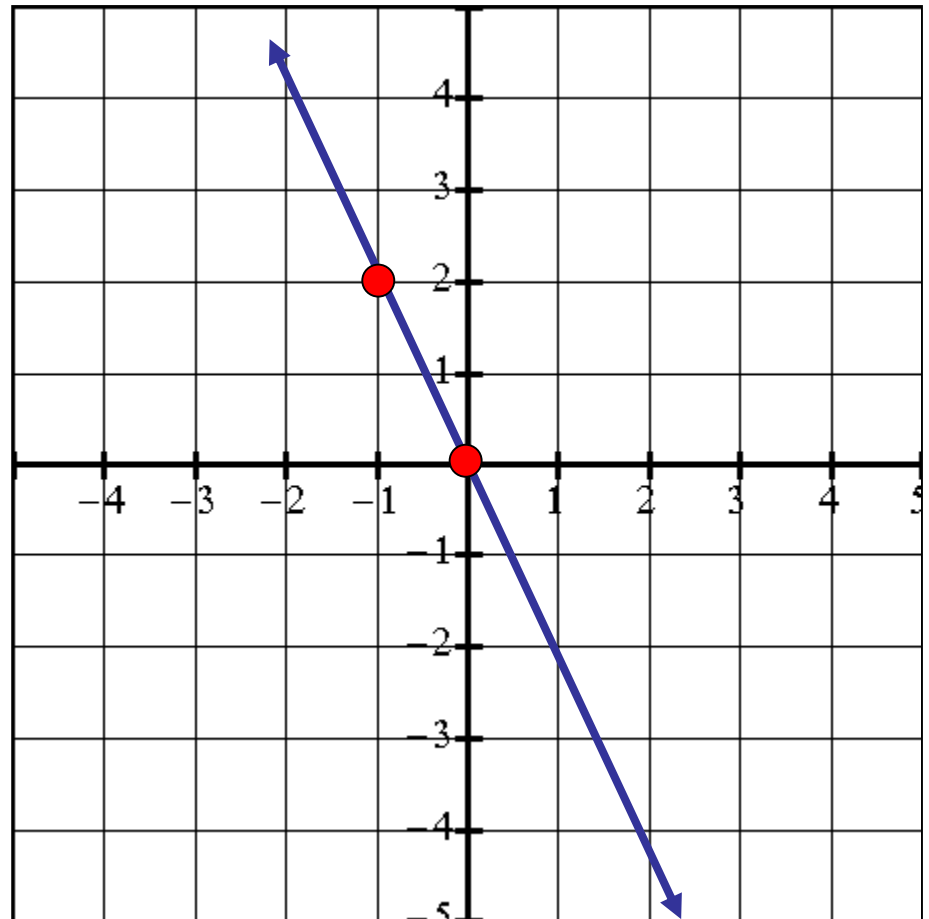
Determine the following:

slope: -2

y-int: 0

equation:

$$y = -2x$$



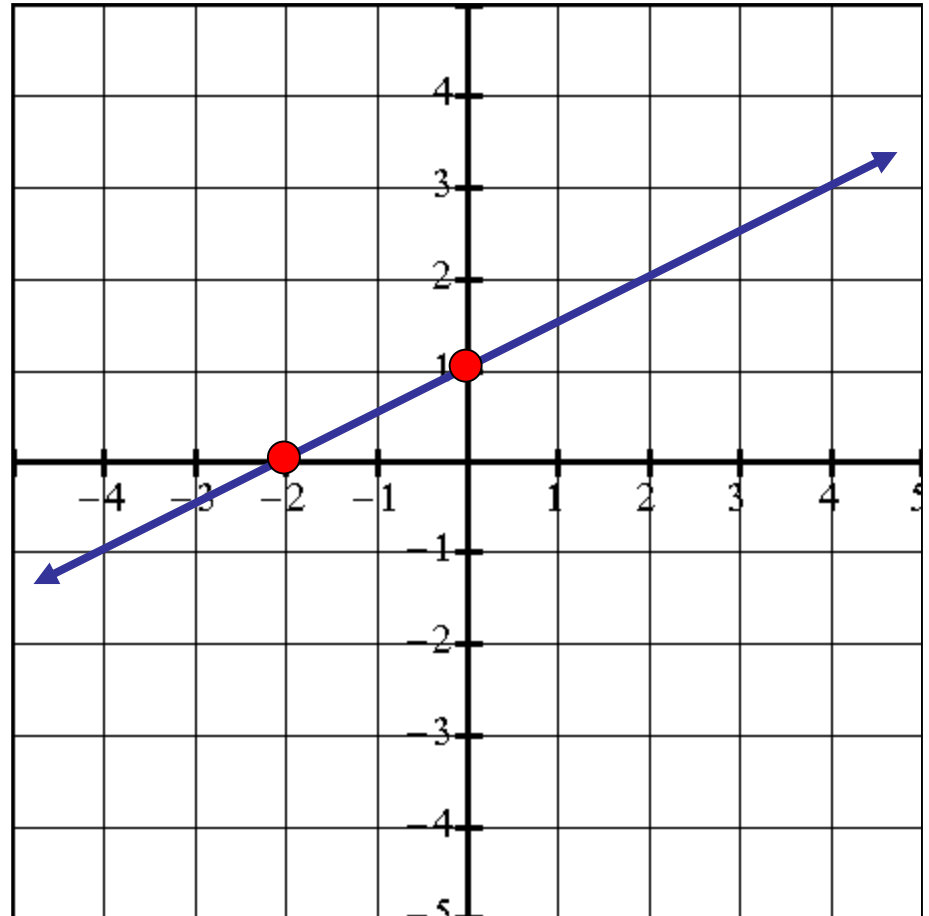
Determine the following:

slope: $\frac{1}{2}$

y-int: 1

equation:

$$y = \frac{1}{2}x + 1$$



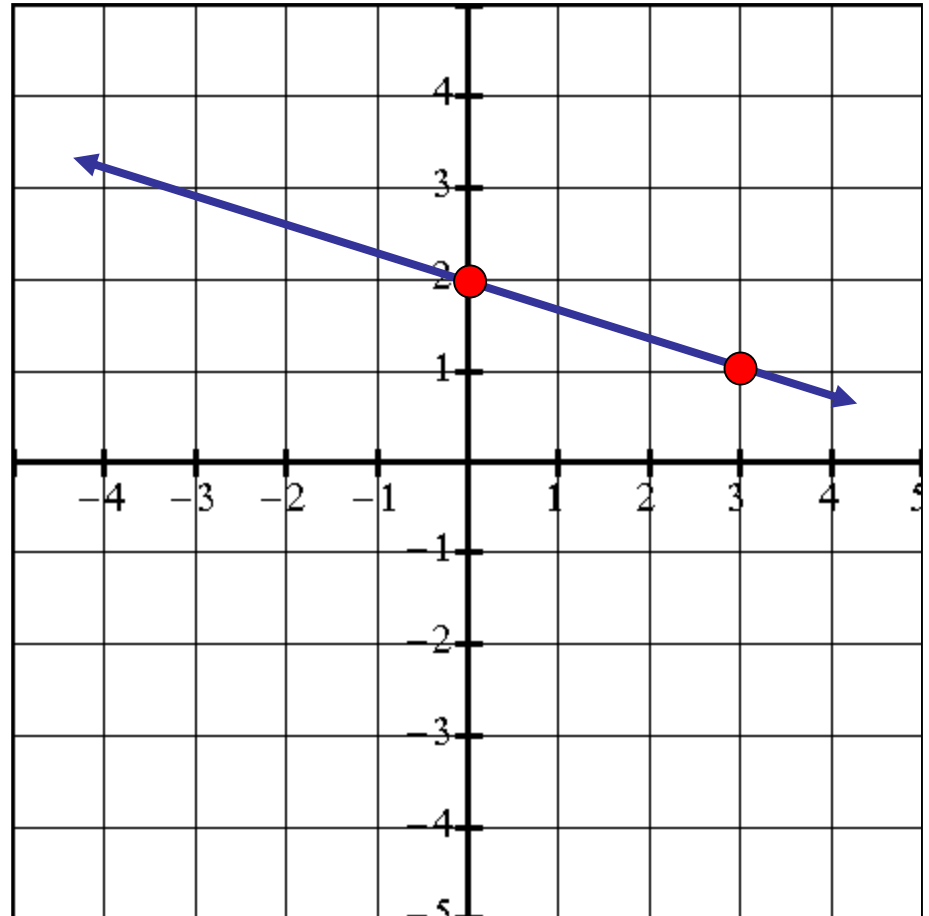
Determine the following:

slope: $-\frac{1}{3}$

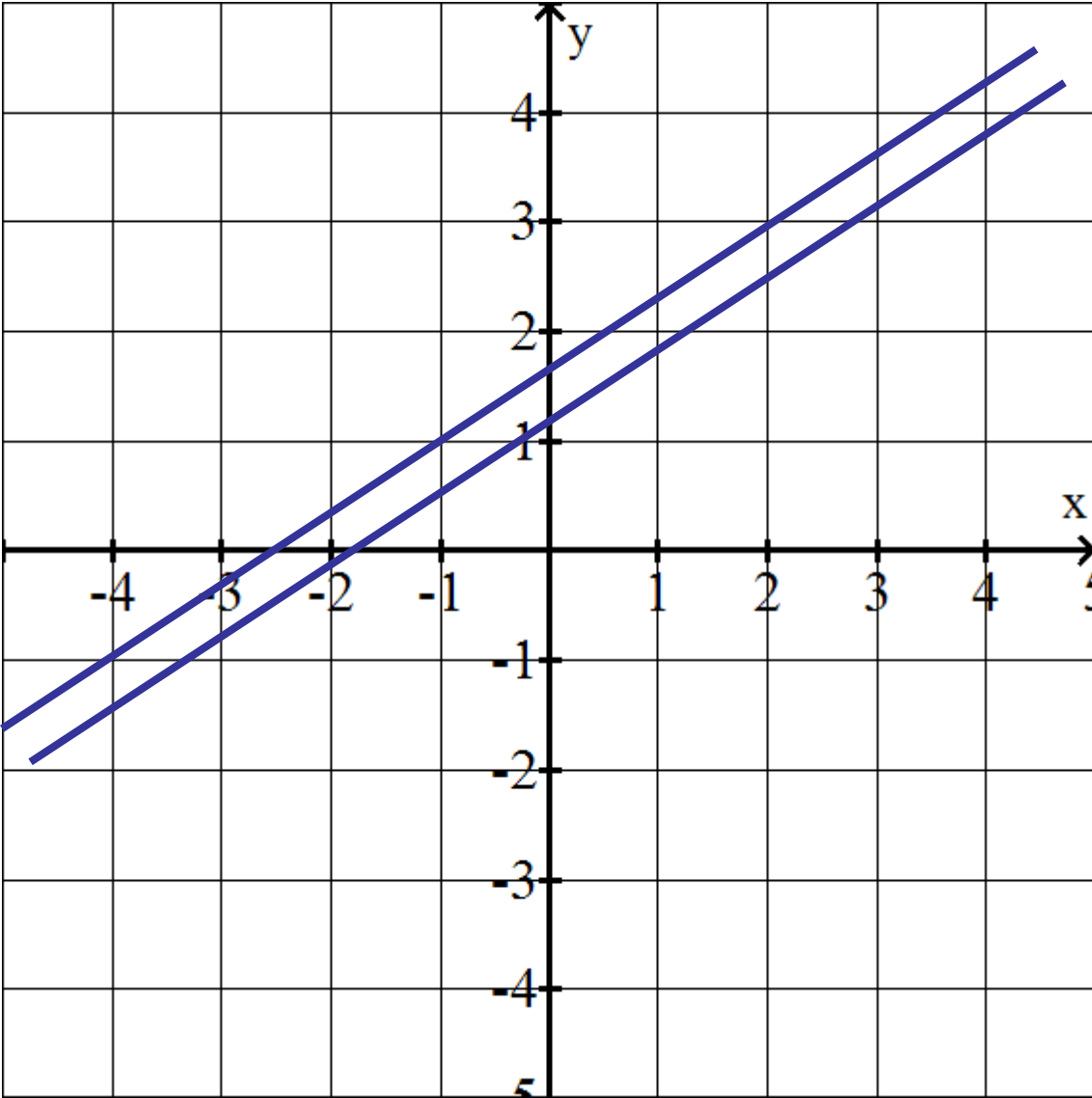
y-int: 2

equation:

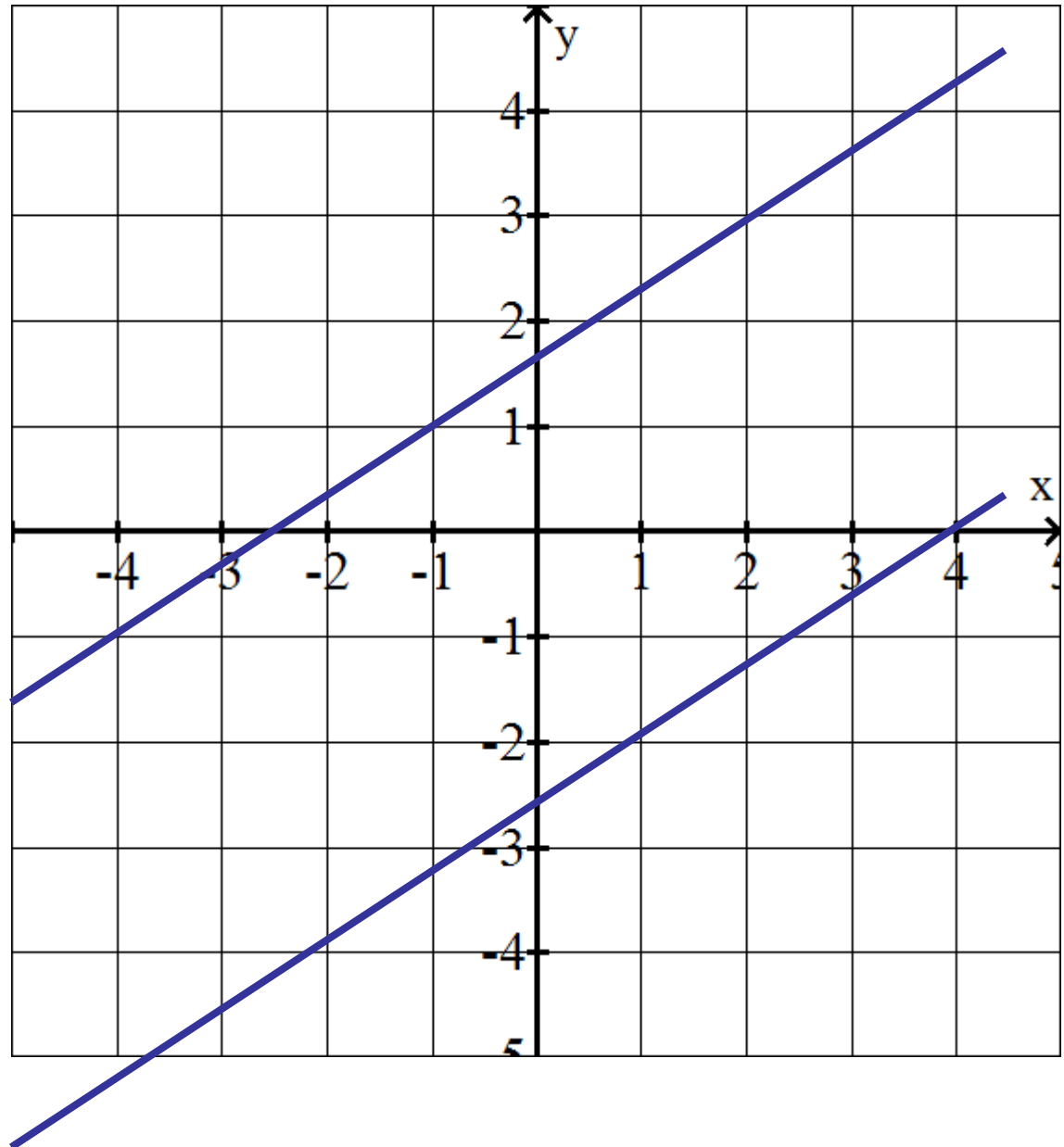
$$y = -\frac{1}{3}x + 2$$



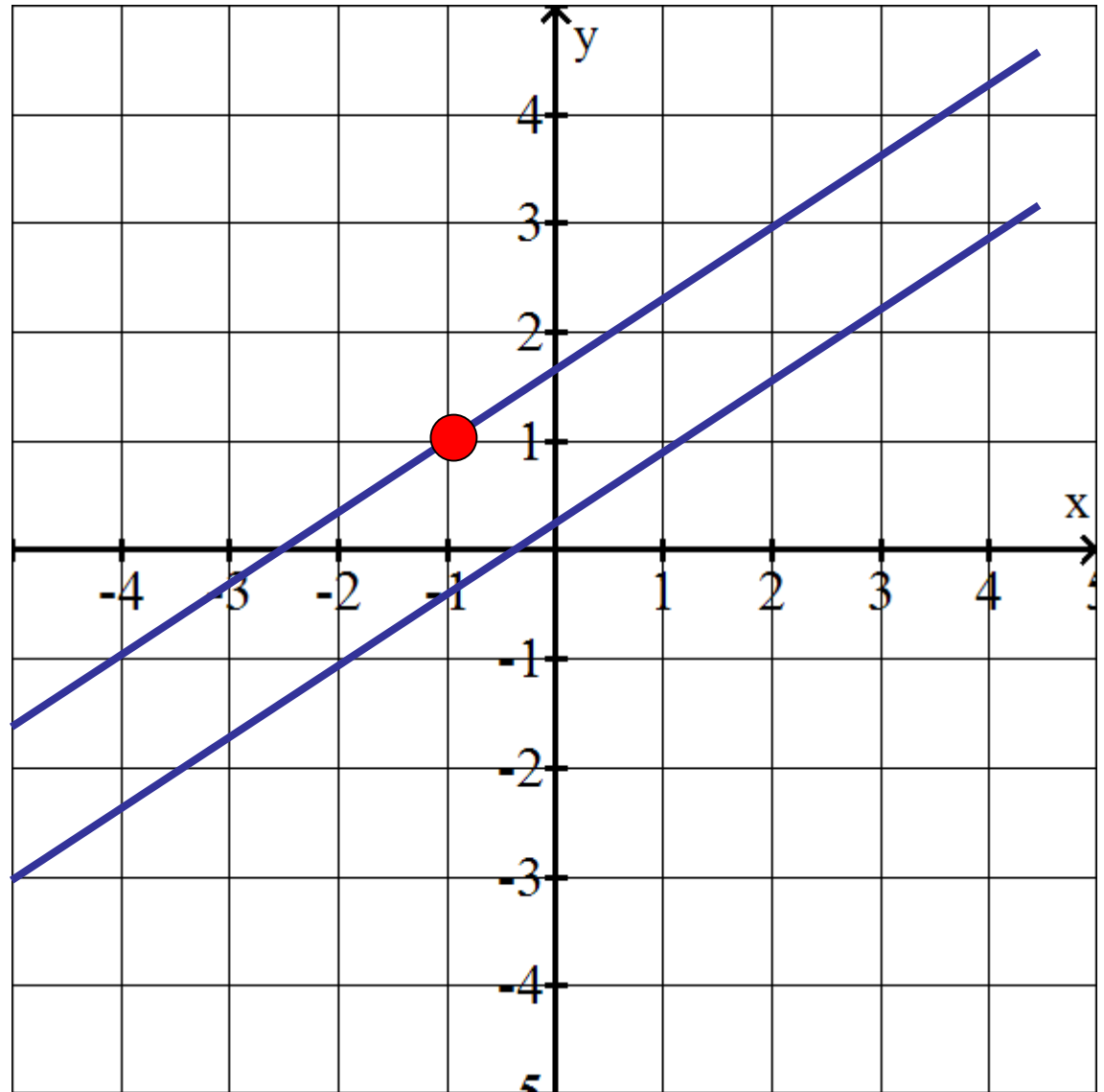
No solution



Infinite number of solutions



One solution

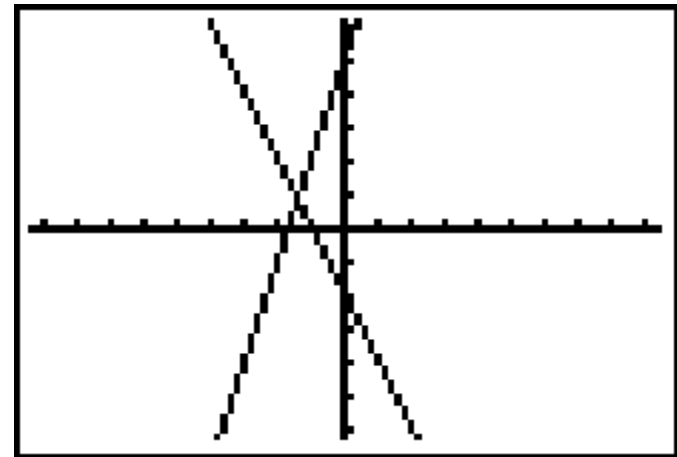
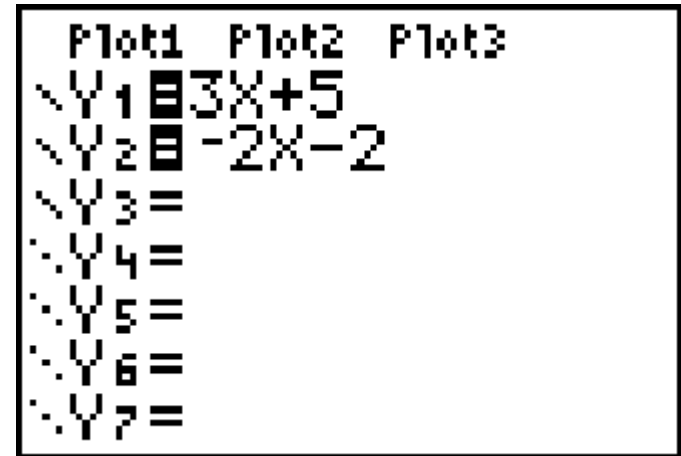


A linear system can have different types of solutions.

1) $y = 3x + 5$

$$y = -2x - 2$$

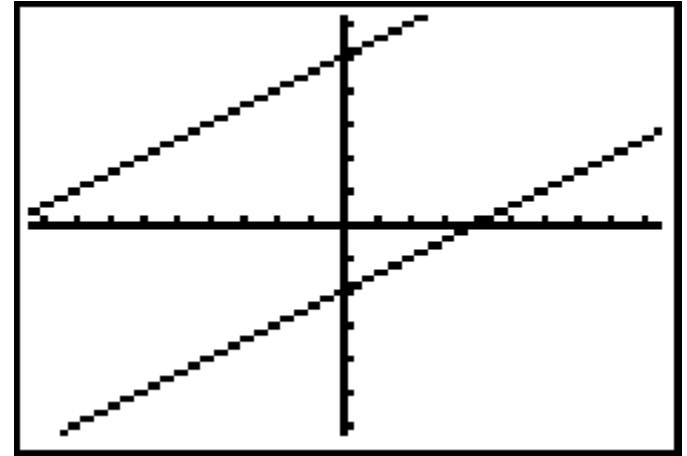
The system has *one* solution.



$$2) \quad y = 0.5x + 5$$

$$y = 0.5x - 2$$

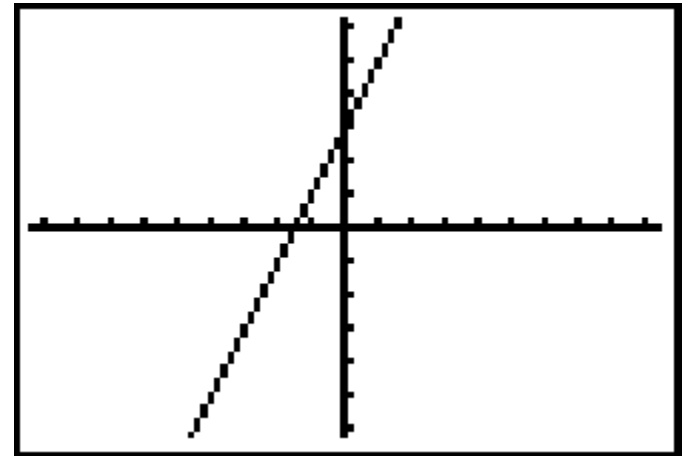
The system has *no* solution.



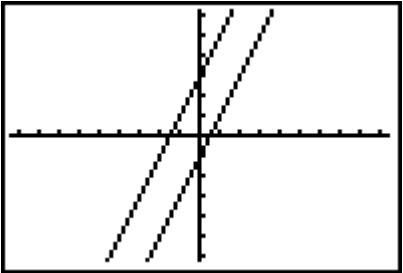
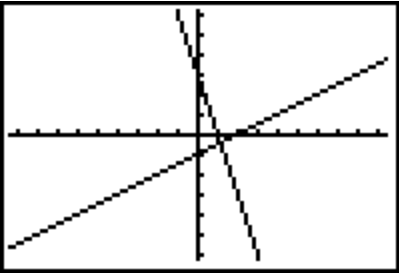
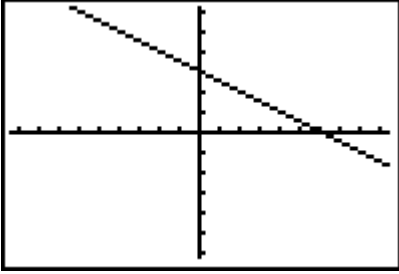
$$3) \quad y = 2x + 3$$

$$3y = 6x + 9$$

The system has *an infinite number* of solutions.



Solutions to a Linear System

<p>same slope different y-intercept</p>		<p>no solution</p>
<p>different slopes</p>		<p>one solution</p>
<p>same slope same y-intercept</p>		<p>infinite number of solutions</p>

Example: Determine the number of solutions to the linear system.

a) $y = 3x + 1$

$y = 3x - 2$

no solution

b) $y = 3x + 1$

$y = -2x + 1$

one solution

Example: Determine the number of solutions to the linear system.

c) $2x - y = 2$

$$y = 2x + 3$$

no solution

d) $3x - y = 5$

$$6x - 2y = 10$$

infinite number
of solutions

Example: Determine the number of solutions to the linear system.

e) $5x - 3y = 6$

$$10x - 6y = 5$$

no solution

f) $4x - 3y = 5$

$$2x + 5y = 10$$

one solution