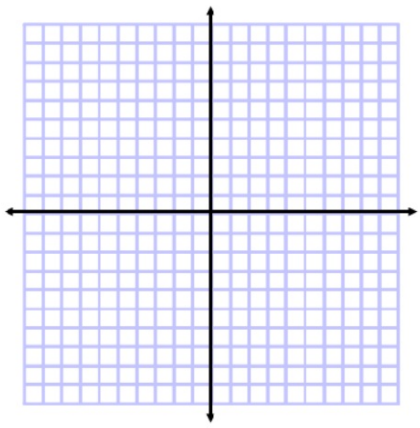
Algebra 1 6.1

Determine the number of solutions to a system of linear equations

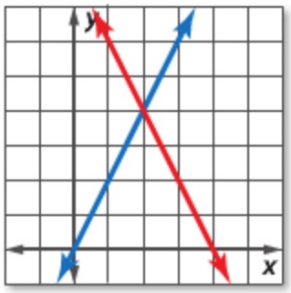
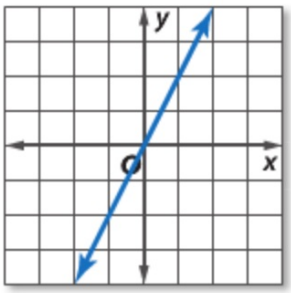
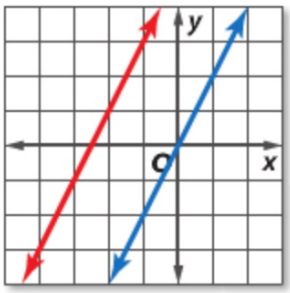
Solve systems of linear equations by graphing

linear equation
system of equations
consistent
inconsistent
independent
dependent

graph matching: equation, table, graph

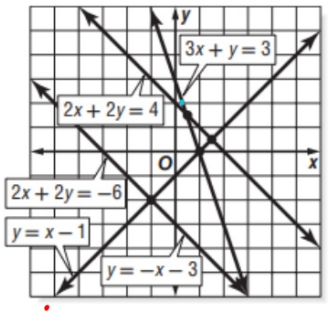


ConceptSummary Possible Solutions

Number of Solutions	exactly one	infinite	no solution
Terminology	consistent and independent	consistent and dependent	inconsistent
Graph			

Exercises

Use the graph at the right to determine whether each system is *consistent* or *inconsistent* and if it is *independent* or *dependent*.



1. $y = -x - 3$
$y = x - 1$

C + Ind
(−1, −2)

2. $2x + 2y = -6$
$y = -x - 3$

C + D

3. $y = -x - 3$
$2x + 2y = 4$

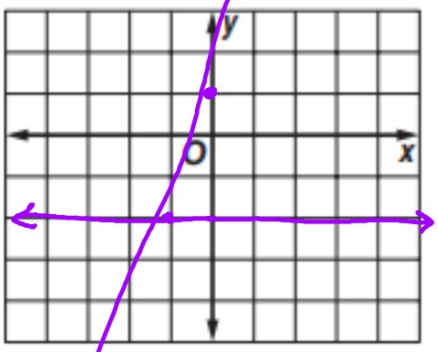
Inc

4. $2x + 2y = -6$
$3x + y = 3$

C + Id
(3, −6)

1. $y = -2$

$3x - y = -1$



$3x - y = -1$

$-3x \quad -3x$

$y = 3x + 1$

$-y = -3x - 1$

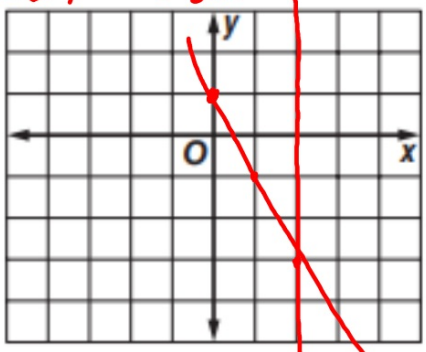
$\frac{-y}{-1} = \frac{-3x}{-1} - \frac{1}{-1}$

2. $x = 2$

$2x + y = 1$

$-2x \quad -2x$

$y = -2x + 1$



4. $2x + y = 6$

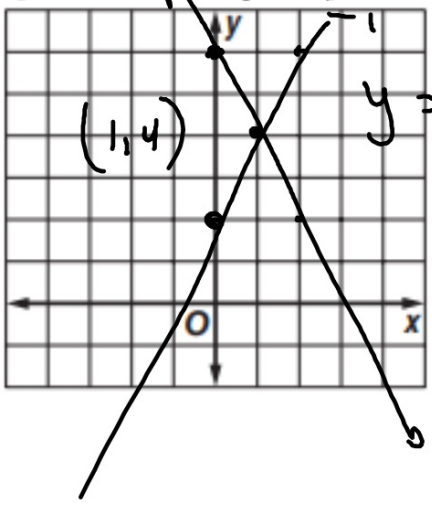
$2x - y = -2$

$y = -2x + 6$

$-y = -2x - 2$

$y = 2x + 2$

(1, 4)

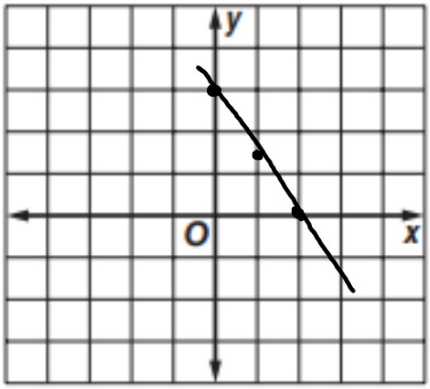


5. $3x + 2y = 6$

$3x + 2y = -4$

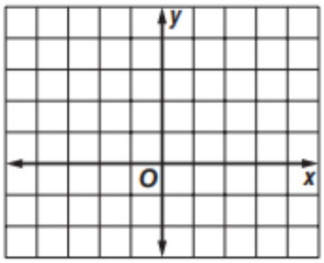
-1.5

$-\frac{3}{2}$



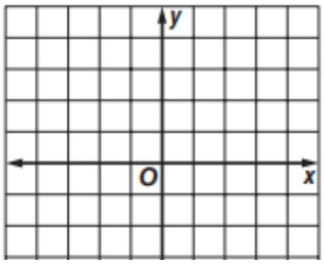
3. $y = \frac{1}{2}x$

$x + y = 3$



6. $2y = -4x + 4$

$y = -2x + 2$



2. **ARCHITECTURE** An office building has two elevators. One elevator starts out on the 4th floor, 35 feet above the ground, and is descending at a rate of 2.2 feet per second. The other elevator starts out at ground level and is rising at a rate of 1.7 feet per second. Write a system of equations to represent the situation.

$y = -2.2x + 35$

$y = 1.7x$

3. **FITNESS** Olivia and her brother William had a bicycle race. Olivia rode at a speed of 20 feet per second while William rode at a speed of 15 feet per second. To be fair, Olivia decided to give William a 150-foot head start. The race ended in a tie. How far away was the finish line from where Olivia started?

$D = 20\frac{ft}{s} \cdot 30s$

$= 600ft$

O: $20\frac{ft}{s}$

W: $15\frac{ft}{sec}$, 150 ft

Start: y int = B

rate of change = slope = m

$20x + 0 = 15x + 150$

$-15x \quad -15x$

$5x = 150$

$x = 30$