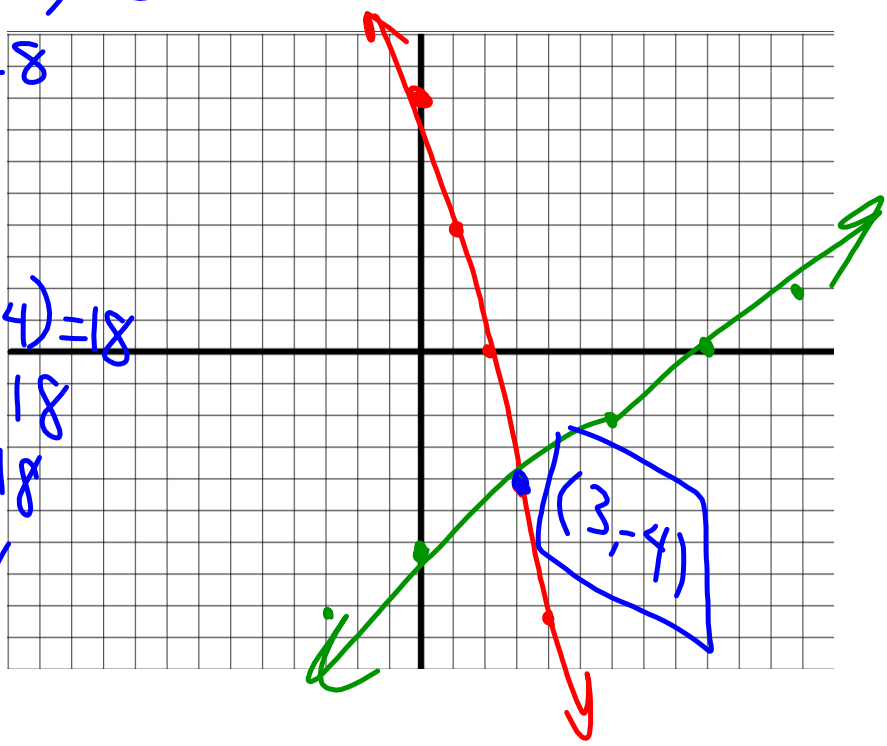
# 3.1 Solve Linear Systems by Graphing

**EXAMPLE 1** Solve a system graphically

Graph the linear system and estimate the solution. Then check the solution algebraically.

$$4x + y = 8$$
$$2x - 3y = 18$$




$4(3)+(-4)=8$

$12-4=8$

$8=8$

✓

$2(3)-3(-4)=18$

$6+12=18$

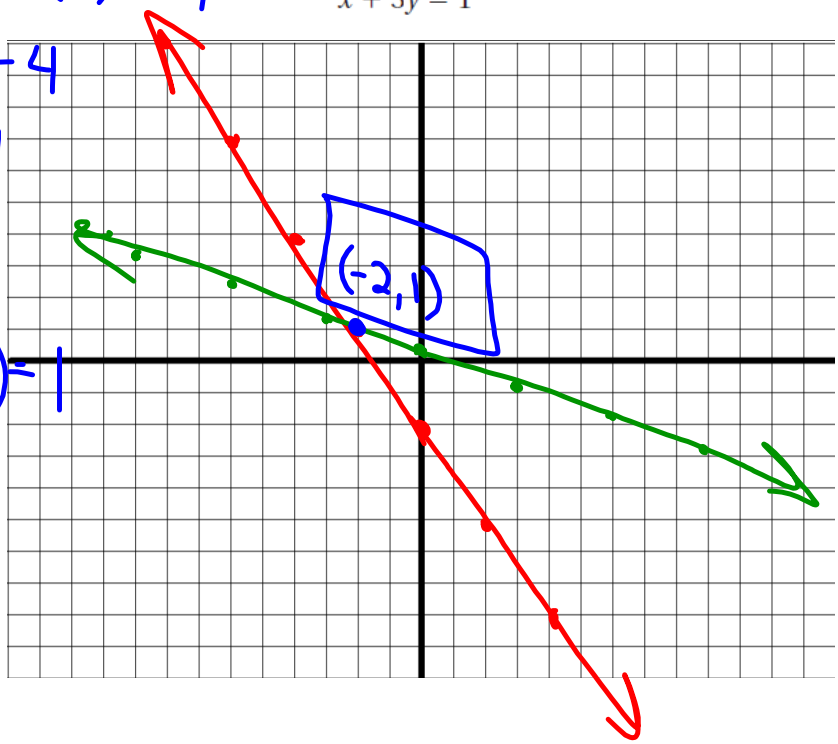
$18=18$

✓

**EXAMPLE 1** **Solve a system graphically**

**Graph the linear system and estimate the solution. Then check the solution algebraically.**

$$3x + 2y = -4$$
$$x + 3y = 1$$




$3(-2)+2(1)=-4$

$-6+2=-4$

$-4=-4$

✓

$(-2)+3(1)=1$

$-2+3=1$

$1=1$

✓

***Vocab:***

***Consistent-*** at least one solution

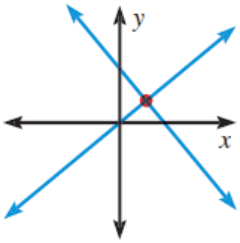
***Inconsistent-*** no solution

***Independent-*** exactly one solution

***Dependent-*** many solution

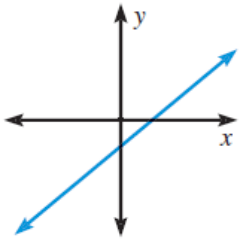
***Classify the systems as consistent/inconsistent and dependent/independent***

**Exactly one solution**



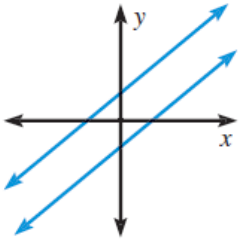

consistent + independent

**Infinitely many solutions**




consistent + dependent

**No solution**

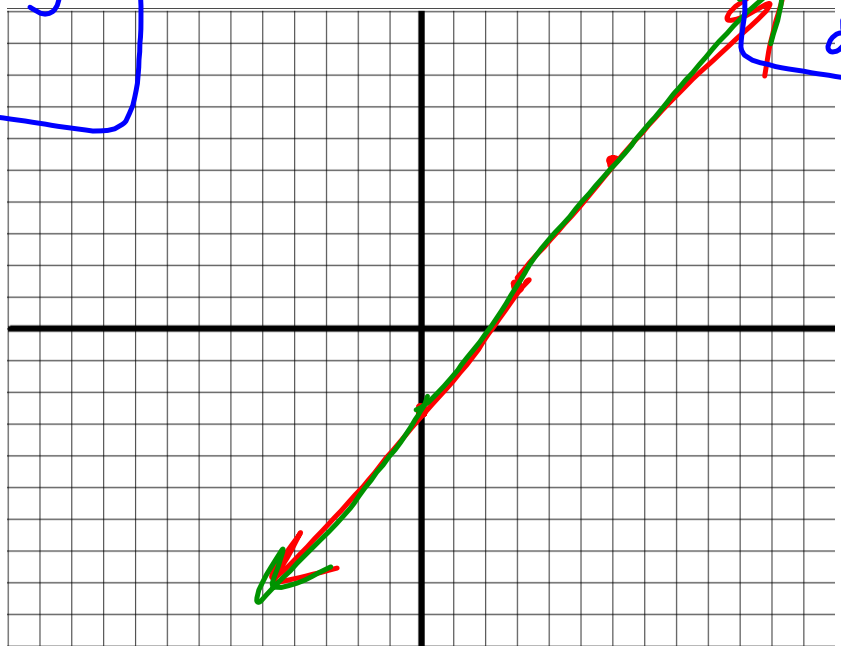



inconsistent

**EXAMPLE 2** **Solve a system graphically**

Solve the system. Then classify the system as *consistent and independent*, *consistent and dependent*, or *inconsistent*.

$$4x - 3y = 8$$
$$8x - 6y = 16$$



Infinitly many

class: consistent & dependent

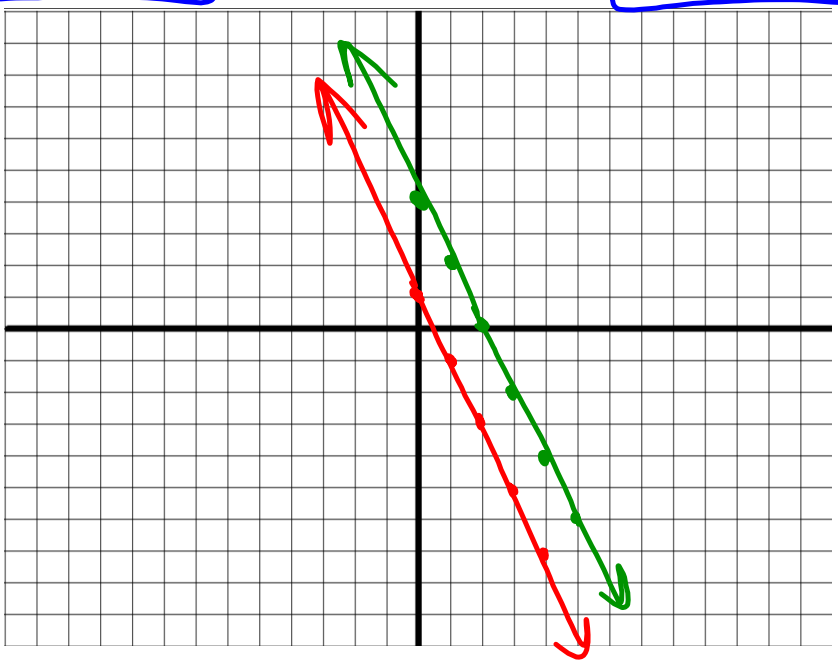
**EXAMPLE 3** **Solve a system graphically**

Solve the system. Then classify the system as *consistent and independent*, *consistent and dependent*, or *inconsistent*.

$$2x + y = 4$$
$$2x + y = 1$$

No solution

class: Inconsistent



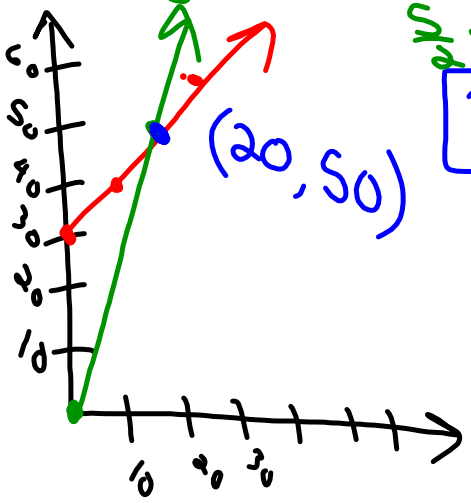
## EXAMPLE 4

You ride an express bus from the center of town to your street. You have two payment options. Option A is to buy a monthly pass and pay $1 per ride. Option B is to pay $2.50 per ride. A monthly pass costs $30. After how many rides will the total costs of the two options be the same?

Option A: $y = 30 + 1x$

Option B: $y = 0 + 2.5x$

$2.5x$




20 rides