Assigned Work: p. 59 # 1, 2a, 3abcfh, 4, 6*

Distinct or Coincident Lines (1.7)

Remember the linear systems that we solved by graphing in our first lesson?

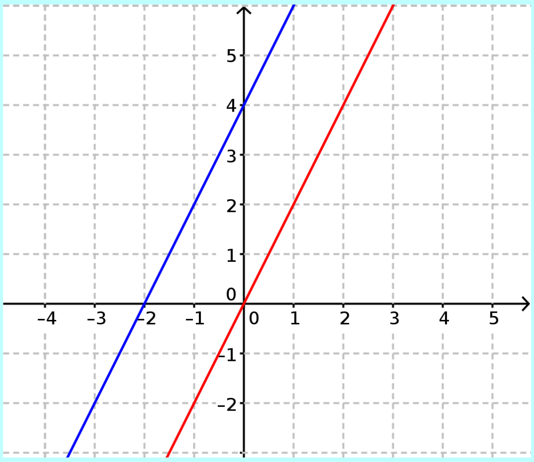
a) $y = 2x + 4$
$y = 2x$

b) $y = 2x + 4$
$y = -x + 4$

c) $y = x - 3$
$4x - 4y = 12$

Feb 14 - 3:29 PM

a) $y = 2x + 4$
$y = 2x$



These lines are parallel and distinct. There is no solution to the system.

What would happen when you tried solve this system algebraically?

Feb 11-7:36 AM

Assigned Work: p. 59 # 1, 2a, 3abcfh, 4, 6*

Distinct or Coincident Lines

Feb 17/2016

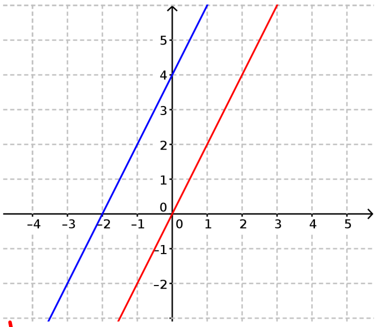
Solve the following linear system using an algebraic method.

$$y = 2x + 4 \quad (1)$$
$$y = 2x \quad (2)$$

$(1) - (2)$: $0 = 0 + 4$

$\underbrace{0 = 4 \ ?}_{}$

0 is never equal to 4

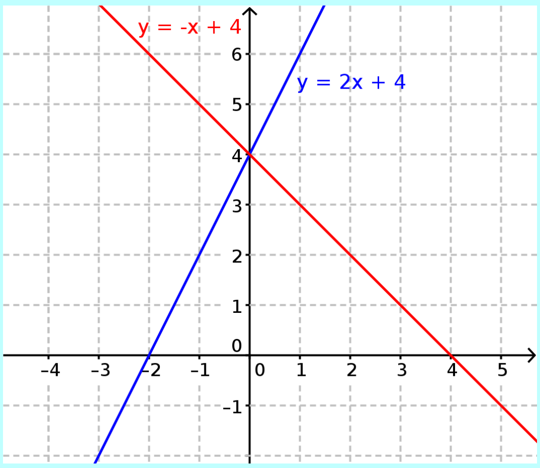


parallel lines never meet

∴ no solution (distinct)

Feb 11-7:25 AM

b) $y = 2x + 4$
$y = -x + 4$



These lines are not parallel. There is **one** solution to the system.

What would happen when you solve this system algebraically?

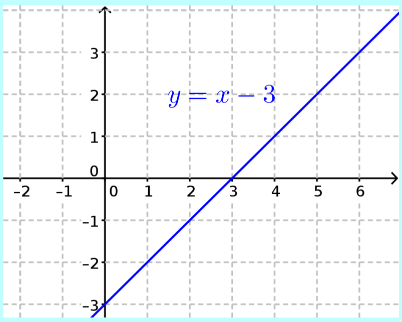
Feb 11-7:39 AM

Solve the following linear system using an algebraic method.

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

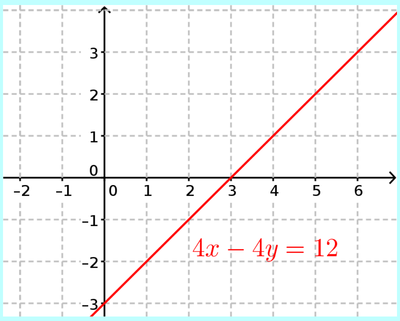
Feb 11-7:44 AM

c) $y = x - 3$
$4x - 4y = 12$



These lines are the same (coincident).

There are **infinitely many** solutions to the system.



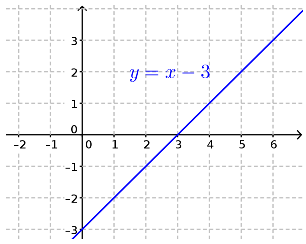
What would happen when you try to solve this system algebraically?

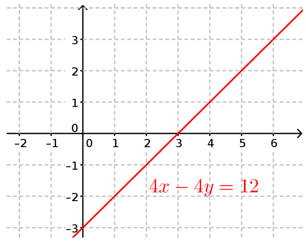
Feb 11-7:41 AM

Solve the following linear system using an algebraic method.

$y = x - 3$ ①

$4x - 4y = 12$ ②





Sub ① into ②

$4x - 4(x-3) = 12$

$4x - 4x + 12 = 12$

$12 = 12$ ✓

$-12 \quad -12$

$\underbrace{0 = 0}_{\text{always true}}$ ✓

∴ infinite solutions (coincident lines)

Feb 11-7:46 AM

When solving a linear system algebraically:

Exactly One Solution:
- you can find the value of one of the variables and then solve for the other.

No Solution:
- you end up with an untrue statement.
  e.g. $0x = 2$ is never true
- these lines are distinct.

Infinitely Many Solutions:
- you end up with a statement which is true for any value of x.
- $0x = 0$ is always true
- these lines are coincident.

Assigned Work: p. 59 # 1, 2a, 3abcfh, 4, 6*

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Ex.1 Write a linear system with:

a) infinitely many solutions

b) no solution

State why it satisfies the condition and then solve the system.

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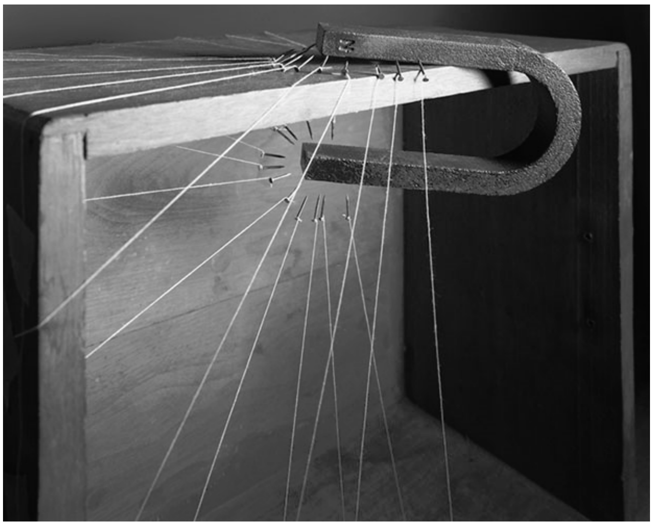
Assigned Work:
p. 59 # 1, 2a, 3abcfh, 4, 6*
b



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3(f) $3x - 5y - 2 = 0$ ①
$4x + 5y + 2 = 0$ ②

zero	one	~~infinite~~
same slope diff. y-int	diff. slope	~~same slope same y-int~~

① + ②: $7x + 0 + 0 = 0$

$$7x = 0$$
$$\frac{7x}{7} = \frac{0}{7}$$
$$x = 0$$

Sub $x = 0$ into ① or ②.

Feb 18-2:04 PM

3(h) $2x - 5 = 4y$ ①

$0.01x - 0.02y = 0.25$ [×100]

$x - 2y = 25$ ②

$x = 2y + 25$ ③

Sub ③ into ①

$$2(2y+25) - 5 = 4y$$
$$4y + 50 - 5 = 4y$$
$$-4y \qquad -4y$$
$$45 = 0$$

∴ no solution

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4 (b) one diff. slope

$y = 3x + 2$ ① $y = 2x - 1$ ②

sub ① into ②

②: $y = 2x - 1$

$3x + 2 = 2x - 1$

$3x - 2x = -1 - 2$

$x = -3$

Feb 18-2:16 PM