Intro to systems of equations

What is a system of equations?

A set of 2 or more equations that share a common solution

If our system is made up of 2 linear equations it could have 1 solution

This solution will consist of an x and y value

General rule - 2 variables require 2 equations, 3 variables require 3 equations etc.

Everything changes if your equations contain exponents (equations are no longer linear)

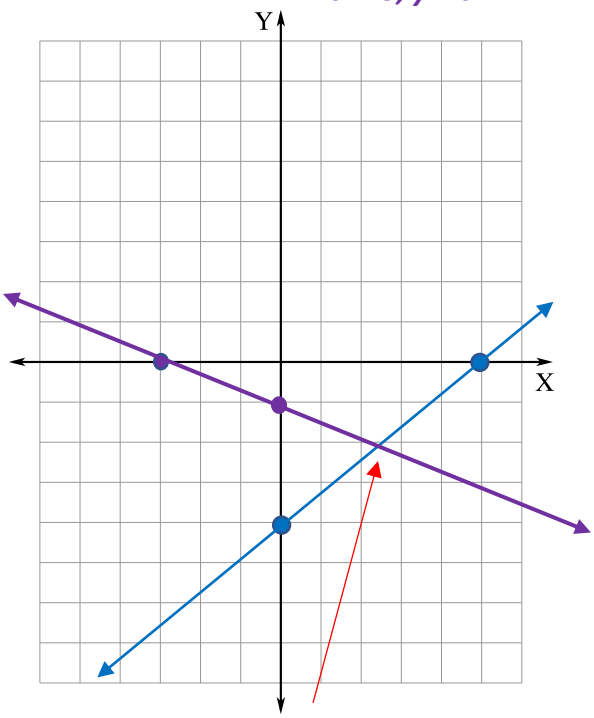
How to solve a system (Method 1)

a) ***2x - 3y = 12***

x int = 6, y int = -4

x + 3y = -3

x int = -3, y int = -1



Solution to system: (2.5, -2.2)

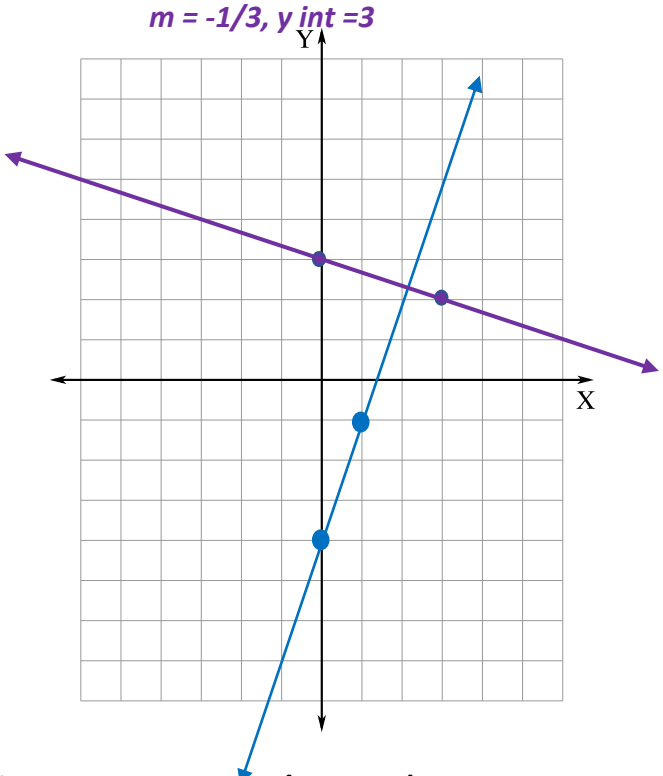
Check: 2(2.5) – 3(-2.2) = 11.6 .. not too bad

b) ***y = 3x - 4***

y int = -4, m = 3

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

m = -1/3, y int =3



Solution to system: (2.1, 2.3)

Check: 3(2.1) – 4 = 2.3 .. nice!

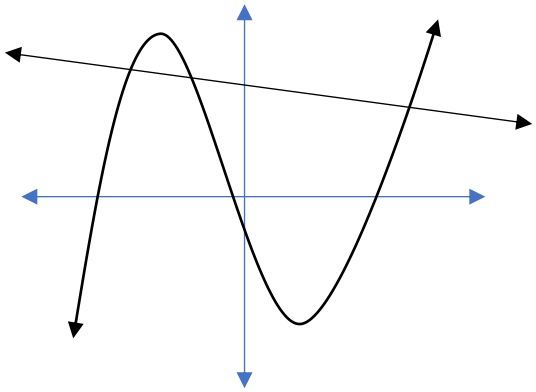
2) ***Why could this system have more than 1 solution***

$y = -3x^2 + 5$

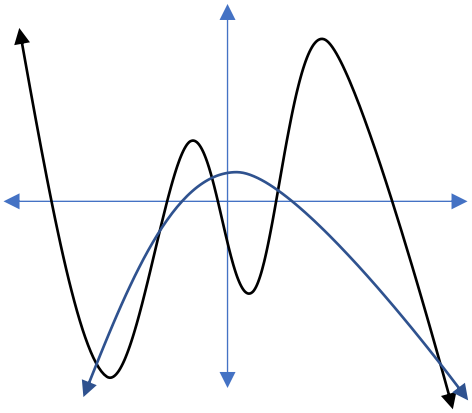
y = 2x + 1

$y = -3x^2 + 5$ is not a line!

3) ***How many solutions do the following systems have?***



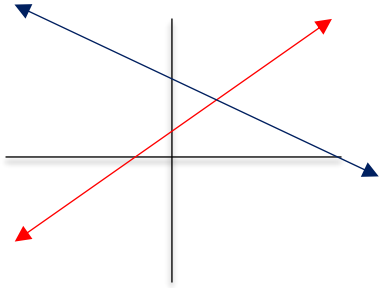
3 solutions



5 solutions

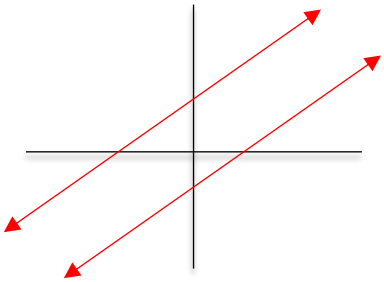
4) ***So how many solutions can a linear system have?***

1 solution



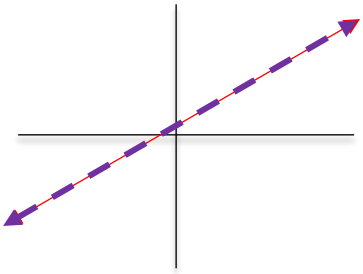
If slopes are different

0 solution



if slopes are equal

∞ solutions



if lines are the same

5) ***Without graphing, how many solutions will the following systems have?***

a) $y = 6x + 19$
$y = 6x - 4$

both have m = 6
0 solutions

b) $y = 5x - 10$
$y = 8x - 4$

different slopes
$m_1 = 5 \quad m_2 = 8$
1 solution

c) $y = 8x + 7$
$y = -2x + 8$

different slopes
$m_1 = 8 \quad m_2 = -2$
1 solution

d) $y = 18x + 10$
$\frac{1}{2} y = 9x + 5$

Multiple bottom equation by 2
And it becomes y = 18x + 10
Same lines = ∞ solutions

e) $y = -2x + 10$
$y = \frac{1}{2} x + 10$

perpendicular slopes ≠
1 solution

Assignment = worksheet

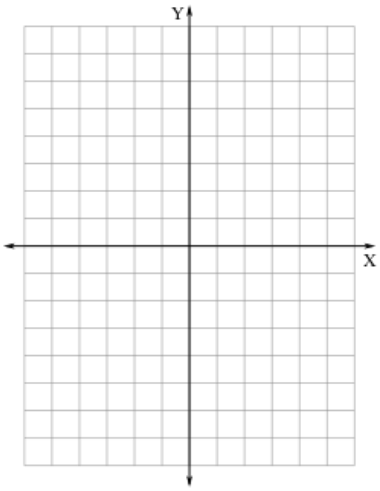
Intro to systems (Graphing Techniques)

What were the headlines after a mad scientist trained 2 eggs to attack a candy store with sharp sticks? ***(hint – use a ruler, hit your points dead-on!)***

TW (−4, 0)	EG (−4, −5)	OS no solution	GS (4, 1)	WE (3, 1)	ET (−2, −4)	SP (−1, 6)	TR (−3, −1)
EA (−3, 5)	TS (1, 2)	RA (0, 3)	TI (2, −3)	MI (4, −3)	SS (5, −2)	NT (−1, 0)	UP (−2, 2)

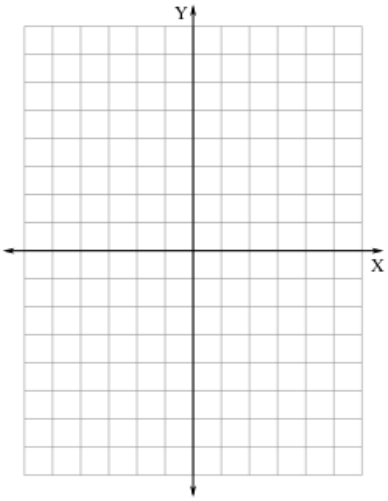
1 $y = \frac{2}{3}x - 1$

y = -x + 4



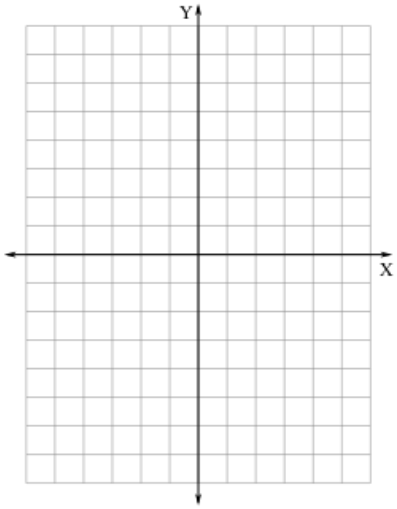
2 ***y = -2x + 1***

y = x − 5



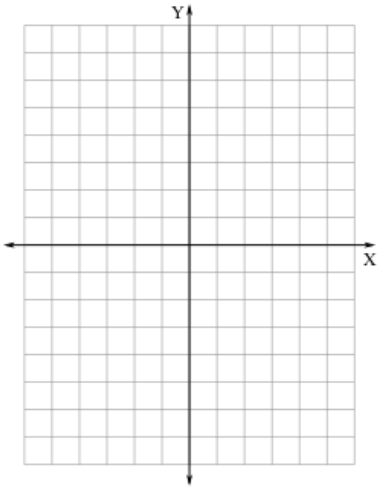
3 $y = \frac{1}{2}x - 3$

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



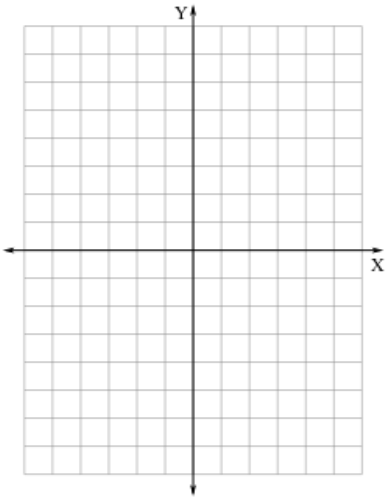
4 $y = 2x$

x + y = 3



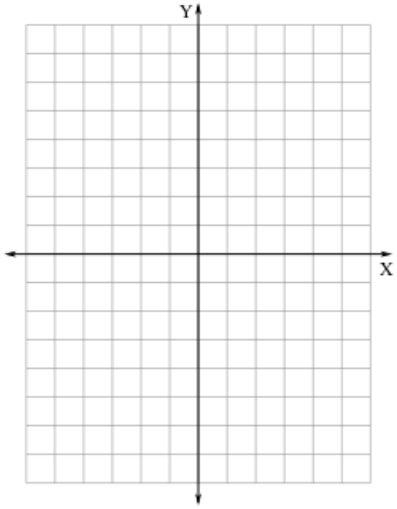
5 ***x + y = 0***

3x + y = -4



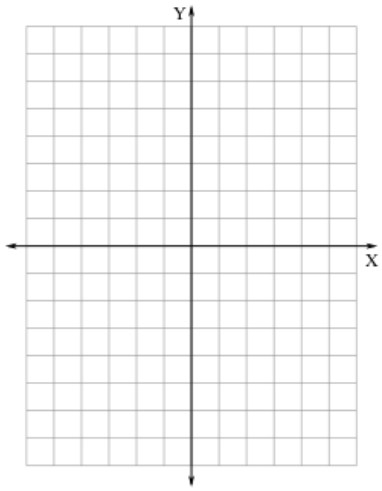
6 $x = 3 - 3y$

$x + 3y = -6$

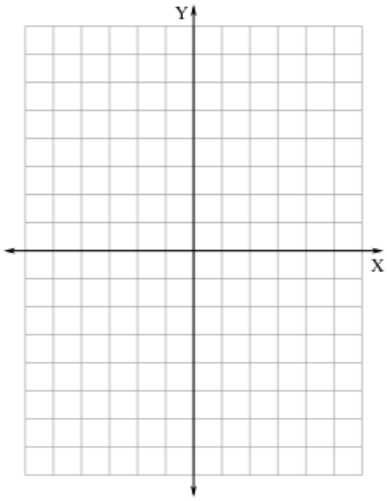


Flip for last 2 questions …

7 $x + 2y = -4$
4y = 3x + 12



8 ***y = -2***
2x – 5y = 20



2) Without graphing determine if the following systems will have 0, 1 or infinite solutions

a) ***y = 8x + 10***
y = 3x – 4

b) ***y = -4x – 10***
y = -4x – 4

c) ***y = 12x + 7***
y = -12x + 1

d) ***y = 7x + 10***
2y = 14x + 20

e) ***5x + y = 10***
5x + y = 19

f) ***16x – y = 18***
-16x + y = 0

g) ***y = 2x – 1***
4y = 2x + 20

h) ***-6x + y = 10***
6x + y = 19

i) ***20x – y = 18***
-20x + y = 7

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3a) ***b)*** ***c)*** ***d)***

4a) ***b)***