12c), 3c), 22

3c) $3x - 4y = 1$ ①

$\ominus$ $3x - 2y = -1$ ②

$-2y = 2$

$\frac{-2y}{-2} = \frac{2}{-2}$

$y = -1$

sub $y = -1$ into ①

$3x - 4(-1) = 1$

$3x + 4 = 1$

-4

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

$x = -1$

12. c) $0.03x + 0.15y = 0.027 \times 50$

$-0.5x - 0.5y = 0.05 \times 3$

② × 3 − ① × 50

② $-1.5x - 1.5y = 0.15$

① $\oplus$ $1.5x + 7.5y = 1.35$

$6y = 1.50$

$\frac{6y}{6} = \frac{1.50}{6}$

$\Rightarrow y = 0.25$

#22. let x = the amount invested in the stock

y = " " " " bond

$10.5\%x + 3.5\%y = 84$ ①

$0.105x + 0.035y = 84$ ①

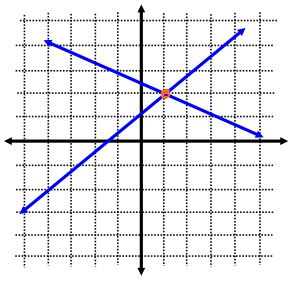
$3.5\%x + 10.5y = 14$

$0.035x + 0.105y = 14$ ②

7.6 Properties of Linear Systems

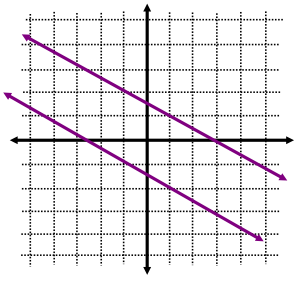
* Systems of linear equations may have...

one solution



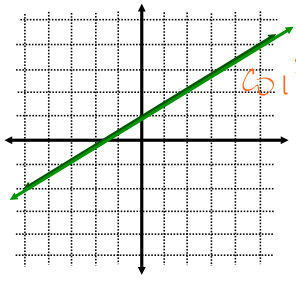
* slopes are **different**

no solution



* slopes are **the same**
* y-intercepts are **different**

∞ solutions



called coincident lines

* slopes are **the same**
* y-intercepts are **the same**

the easiest form of equⁿ to use is $y = mx + b$ (slope / y-int.)

ex. Find the number of solutions to each system without solving.

a) $2x + y = 8$ ①
$4x + 2y = 16$ ②

$-2x$, $-4x$

① $y = -2x + 8$

② $\frac{2y}{2} = \frac{-4x}{2} + \frac{16}{2}$

② $y = -2x + 8$

same line

∴ Since the equations represent coincident lines, there are infinite sol'ns.

b) $3x + y = 9$ ①
$6x + 2y = 12$ ②

$-3x$, $-6x$

① $\Rightarrow y = -3x + 9$

② $\Rightarrow \frac{2y}{2} = \frac{-6x}{2} + \frac{12}{2}$

② $y = -3x + 6$

- Same slope
- different y-int.

∴ the lines are parallel but distinct (different)

∴ NO sol'n

c) $x + y = 8$ (−x) ① $y = -x + 8$

$-5x + y = 1$ (5x) ② $y = 5x + 1$

different slopes ∴ one point of intersection

ex. Given the equation $-2x + y = 4$ ① , write another equation that will form a system with:

a) one solution

① $-2x + y = 4$

② $y = -3x - 2$ or ② $-473x + 2y = 6$

b) no solutions

① $-2x + y = 4$

② $-4x + 2y = 7$ or ② $-4x + 2y = 2$

c) infinite solutions

① $-2x + y = 4$

② $-4x + 2y = 8$ (×(−1)) ② $2x - y = -4$

review

① $y = 3x - 5$ ⇒ $y = 3(2) - 5$, $y = 1$

② $2x + 3y = 7$

$2x + 3(3x - 5) = 7$

$2x + 9x - 15 = 7$

$\frac{11x}{11} = \frac{22}{11}$

$x = 2$

Homefun: Pg. 448 # 4-9, 13, 15, 16