

Digits Notes 6-1/6-2

Intro to Systems

1/13/2020

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Goal: I will be able to **recognize a system of equations**

Word Bag
Formulas, equations,
Vocabulary, etc.

Here's How... Notes & Examples

Usain Bolt vs Cheetah

How much of a head start does Usain Bolt need?
Can we figure it out?

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To figure it out, we can use the distance formula for each

Usain Bolt

Cheetah

$$d = \text{speed} \cdot \text{time} + \text{lead}$$

bolt

$$d = \text{speed} \cdot \text{time}$$

cheetah

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System of Equations

At least 2 equations and 2 unknowns

Example

$$y = 3x - 4$$

$$y - x = -7$$

U try

Are these systems?

a) $2x + 4y = 8$
 $y = x + 2$
Yes 2 equations 2 unknowns

b) $y = 8x - 5$
no Only 1 equation

c) $5x - 3y = 6$
 $2x + y - 8 = 0$
Yes, 2 equations 2 unknowns

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Solution to a System

Given a point (x, y) , if it makes both equations true, then it is a solution

Example

Is $(2, 4)$ a solution?

a) $y = 2x$
 $y = 6x - 8$
 $4 = 2(2)$
 $4 = 4$ ✓ true
 $4 = 6(2) - 8$
 $4 = 12 - 8$
 $4 = 4$ ✓ true
Yes, it is a solution

b) $x - y = -1$
 $2x - y = 1$
 $2 - 4 = -1$
 $-2 = -1$ NO
Not true
No solution




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Solutions to a System	A solution is the intersection of the 2 lines.
By Inspection	You look at the equations and determine if they have a solution (one, none, infinite)

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One Solution	There is only 1 point that makes both equations true.
No Solution	There is <u>NO</u> point that makes both equations true.
Infinite Solutions	There are infinite points that make both equations true.

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	How can we know? Look at the slopes and the y-intercept
	Different Slopes → One Solution
	Same Slope, Different y-int → No solution
	Same Slope, Same y-int → Infinite Solutions

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	How many solutions?
<p>Try</p> <p>① $y = mx + b$</p> <p>② Look at slope</p> <p>③ Look at y-intercept</p>	<p>a) $y = 2x + 4$ $2y = 5x + 4$ $m = 2, b = 4$ $m = \frac{5}{2} = 2.5$ One solution</p> <p>b) $y = 5x - 6$ $m = 5, b = -6$ $2y = 10x - 12$ $m = \frac{10}{2} = 5$ $b = \frac{-12}{2} = -6$ Infinite</p> <p>c) $y = -9x + 12$ $m = -9, b = 12$ $3y = -27x + 30$ $m = \frac{-27}{3} = -9$ $b = \frac{30}{3} = 10$ No solution</p>