Welcome To Math 34A! Differential Calculus

Instructor

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Office Hours:

T R 11-11:50, T 3:45-4:35 Details on Gauchospace.

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Math 34A is about...

- Problem-solving using reasoning, algebra and arithmetic
- Turning English into Math (and vice versa)

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Math 34A is not about...

- Memorizing formulas
- Rote computations

Here's a blog that explains this point well. Math with Bad Drawings: Just Memorizing Thankfully, we don't make very good robots.

Do You Have An i>clicker?

$$A = Yes, B = No$$

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See https://gauchospace.ucsb.edu/

Syllabus

Introduction 00000

- Homework:
 - On WeBWork (link on GauchoSpace)
 - Due each lecture day before the end of the day
 - First one is due Thursday, Jan 6th!
- Dates of midterm exams and final exam.
 - First midterm is Jan 25! (Yikes!)
- Grading system
- Consider signing up with CLAS = Campus Learning Assistance Services – More info on Gauchocpase.

Introduction

Everything Is On GauchoSpace

See https://gauchospace.ucsb.edu/

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 - This can get very difficult at times.
 - Memorizing formulas is tempting and seems easy, but it's actually harder long-term.
 - Word problems are the point.

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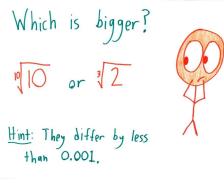
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- You should read the textbook!
 - It's quite good!
 - These lectures are not just presenting the textbook—they complement it.
 - Your homework problems are pulled from the textbook.
 - To be ready for exams you should follow both the textbook and the lectures.

Example Puzzle

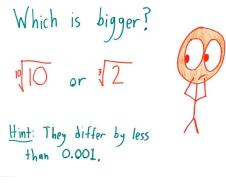
A New Favorite Puzzle



(From Math with Bad Drawings)

Example Puzzle

A New Favorite Puzzle



(From Math with Bad Drawings)

 $\underline{\text{Idea}}$: The number $2^{10}=1024$ is often approximated to a "rounder" number to convey sizes with computer hardware.

1. Solve for x: 4x + 7 = 12

$$A = 3$$
 $B = 6$ $C = 5/4$ $D = 19/4$ $E = ?$

$$E = 19/4$$
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Answer: C

2. Solve for x: ax + b = c.

$$A = c/a$$
 $B = bc/a$ $C = (c+b)/a$ $D = c-b/a$ $E = (c-b)/a$

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Answer: C

2. Solve for x: ax + b = c.

Solve for
$$x$$
. $ax + b = 0$

Answer: E

3. Solve for x: 2x + 7 = ax + k

$$A = (2-k)/(a-7)$$
 $B = (k-7)/(2-a)$

$$C = (k-7)/(a-2)$$
 $D = k-7/a-2$ $E = ?$

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Answer: B

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Answer: B

4. Expand: $(1-x)(1+x+x^2)$

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Answer: B

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Moral: Parentheses are awesome!

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Word Problems

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Answer: 66, 44 The sum of three consecutive numbers is 99. What are the numbers?

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66, 44 Answer:

6. The perimeter of a rectangle is twice its area. Find a formula for the length of the rectangle in terms of its width.

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Answer: 66, 44

6. The perimeter of a rectangle is twice its area. Find a formula for the length of the rectangle in terms of its width.

Answer: $L = \frac{W}{W-1}$

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- Introduction to Percentages
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Questions:

1. What is 3/4 as \%?

$$A = 0.75\%$$
 $B = 30\%$ $C = 7.5\%$ $D = 75\%$

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2. What is 20% of 30?

$$A = 600$$
 $B = 60$ $C = 6$ $D = 0.6$

Introduction to Percentages

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$$A = 600 \quad B = 60 \quad C = 6 \quad D = 0.6 \quad \boxed{\text{C}}$$

- Click A,B,C,D as you do these problems
 - (A) What is 20% of x?
 - (B) What is 70% as a fraction?
 - (C) What is x% of 50?
 - (D) What is $\frac{x}{x+1}$ as %?

You Try It!

- Click A,B,C,D as you do these problems
 - (A) What is 20% of x?
 - (B) What is 70% as a fraction?
 - (C) What is x% of 50?
 - (D) What is $\frac{x}{x+1}$ as %?

Answers: (A) x/5 (B) 7/10 (C) x/2 (D) $\left(\frac{100x}{x+1}\right)\%$ How many did you get right?

$$A = 4 \odot$$
 $B = 3$ $C = 2$ $D = 1$ $E = \odot$

4. If I combine 5 liters of blue paint with 15 liters of red paint, what percentage of red paint is in the combination?

A~15% B~5% C~75% D~25% E~Other

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If I combine x liters of blue paint with y liters of red paint, what percentage of blue paint is in the combination?

$$A \left(\frac{x}{x+y}\right) \% \quad B \left(\frac{y}{x+y}\right) \% \quad C \left(\frac{100y}{x+y}\right) \%$$
$$D \left(\frac{100x}{x+y}\right) \% \quad E \text{ Other}$$

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One More Problem!

6. Express x% of 4 plus y% of 3 as a percentage of 12.

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Idea: Break down the problem into simple steps in English. Explain what I'm doing to myself.

That's it. Thanks for being here.

