

Welcome To Math 34A!

Differential Calculus

Instructor:

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South Hall 6431X (Grad Tower, 6th floor, blue side, first door on the right)

Office Hours:

MTWR after class 2:00-3:00, and by appointment. 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 the iClicker app?

A = Yes, B = No

To join the class, you can go to <https://join.iclicker.com/D7Q6X>

Everything Is On GauchoSpace

See <https://gauchospace.ucsb.edu/>

- Syllabus
- Homework:
 - On WeBWorK (link on GauchoSpace)
 - Assigned each class day, due following night at 11:59 PM
 - First one is today!
- Information about discussions and TAs
- Dates of midterm exams and final exam. (Once I decide them)
- Grading system
- Consider signing up with CLAS = Campus Learning Assistance Services – More info on Gauchospace.

Syllabus

Let's go over the Syllabus now

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 - Memorizing formulas is tempting and **seems** easy, but it's actually harder long-term.
 - Word problems are the point.

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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

Which is bigger?

$$\sqrt[10]{10} \quad \text{or} \quad \sqrt[3]{2}$$

Hint: They differ by less
than 0.001.



(From Math with Bad Drawings)

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

Another Warm-up Puzzle

I was born on the second day
of the last week
of the second to last month
of the last year
of the second to last decade
of the last century
of the second millennium
of our calendar system.

What is my birthdate?

Let's Get Started!

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

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

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

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

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Answer: E

More Problems!

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

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

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

More Problems!

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Moral: Parentheses are awesome!

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

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- cent means hundred
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Questions:

1. What is $3/4$ as %?

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

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Questions:

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- 2.** What is 20% of 30?

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

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- 2.** What is 20% of 30?

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

You Try It!

3. 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!

3. 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?

$A = 4$ 😊 $B = 3$ $C = 2$ $D = 1$ $E =$ 😞

Mixing Paint

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

A $\left(\frac{x}{x+y}\right)\%$ B $\left(\frac{y}{x+y}\right)\%$ C $\left(\frac{100y}{x+y}\right)\%$
D $\left(\frac{100x}{x+y}\right)\%$ E 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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6. Express $x\%$ of 4 plus $y\%$ of 3 as a percentage of 12.

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

That's it. Thanks for being here.

