MA 105 : Calculus
Memes

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Section 1:
General Math Memes


Mr. Nomer
@Mr_Nohmer
"i don't know"
-shows weakness
-demonstrates ignorance
-everybody will think ur dumb
"it's trivial"
-perfect amount of condescending
-elevates you above ur peers
-demonstrates confidence
8:51 PM · 9/4/19 · Twitter for iPhone
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How it feels to do a proof by contradiction
I used the contrary to destroy the contrary

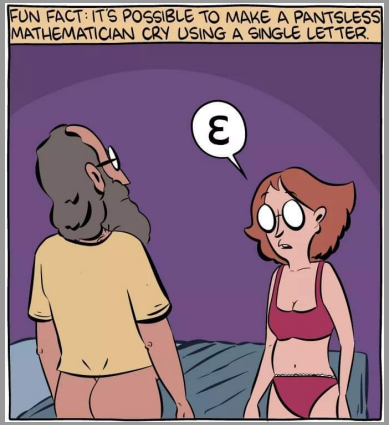
"proof is obvious"
Me:

Professor: understanding proofs will open doors for your understanding of Mathematics

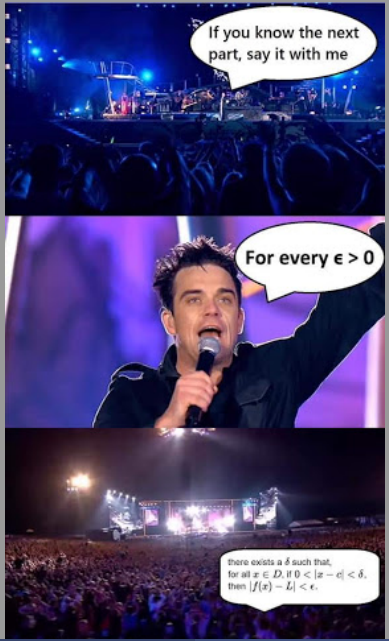
The doors:

Section ϵ


Me running out of Area 51 with an $\varepsilon \leqslant 0$


FUN FACT: IT'S POSSIBLE TO MAKE A PANTSLESS MATHEMATICIAN CRY USING A SINGLE LETTER.
ε

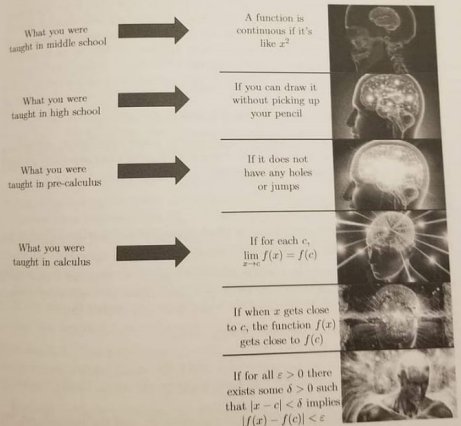
Section $\lfloor \pi \rfloor$: Continuity


If you know the next part, say it with me
For every $\epsilon > 0$
there exists a δ such that, for all $x \in D$, if $0 < |x - c| < \delta$, then $|f(x) - L| < \epsilon$.

Chapter 6: Continuity

6.1 Approaching Continuity

I made a meme describing your discrete approach towards understanding continuity.[1]



[1] Here's to hoping that memes have a longer half-life than I fear!

Section 4 : Integration

WHO WOULD WIN?

some snakey boi	snakey sum boi
	$\int$

"Who are you?"

$$\int_0^2 \int_{\frac{y}{2}}^1 e^{x^2}\,dx\,dy$$

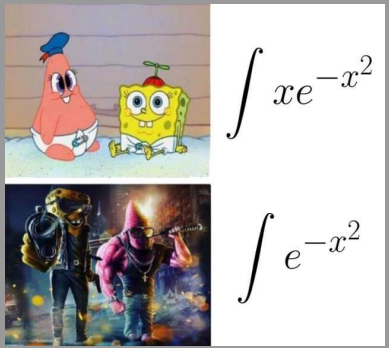
"I'm you, but better"

$$\int_0^1 \int_0^{2x} e^{x^2}\,dy\,dx$$


What if You
Wanted to go to Heaven
But god said
Nahh remember when you
forgot the Jacobian


When you see your mate getting beaten up at the bus stop but then you remember that time when they forgot to multiply their integrand by the Jacobian


A seemingly random integral that you are evaluating
π
F**k


$\int xe^{-x^2}$
$\int e^{-x^2}$

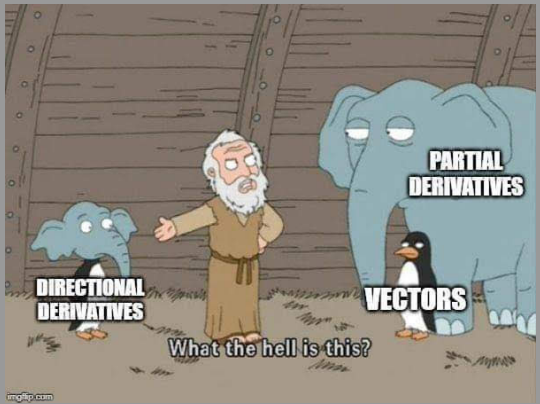
Section 5:
Differentiation

f'(x): * is positive*
f(x):

the derivative of x^2

broke: 2x

woke: with respect to what



REMEMBER SECOND DERIVATIVE TEST?

Second derivative test

Theorem

If $f''(x) > 0$ for all $x \in (a, b)$ then f is convex and if $f''(x) < 0$ for all $x \in (a, b)$ then f is concave.

A point where the curve changes its direction of concavity is called an inflection point. Thus, there is a point of inflection at any point where f'' changes sign.

Theorem

Suppose f'' is continuous near c.

- *If $f'(c) = 0$ and $f''(c) > 0$ then f has a local minimum at c.*
- *If $f'(c) = 0$ and $f''(c) < 0$ then f has a local maximum at c.*

Second derivative test for maxima/minima

Theorem

Let $z = f(x, y)$ have continuous partial derivatives up to second order and suppose that (a, b) is a critical point of f. Consider

$$D = \det \begin{bmatrix} \frac{\partial^2 f}{\partial x^2}(a,b) & \frac{\partial^2 f}{\partial x \partial y}(a,b) \\ \frac{\partial^2 f}{\partial y \partial x}(a,b) & \frac{\partial^2 f}{\partial y^2}(a,b) \end{bmatrix}.$$

- *If $D > 0$ and $\frac{\partial^2 f}{\partial x^2}(a, b) > 0$ then (a, b) is a local minimum,*
- *If $D > 0$ and $\frac{\partial^2 f}{\partial x^2}(a, b) < 0$ then (a, b) is a local maximum,*
- *If $D < 0$ then (a, b) is a saddle point.*

If $D = 0$, then the test fails.

THIS IS HIM NOW.

FEEL OLD YET?

Section 3!: Stocc's

When you prove that

$$\iint_S \nabla \times \vec{A} \cdot d\vec{S} = \oint_C \vec{A} \cdot d\vec{r}$$

$$\oint \nabla f \cdot \mathrm{d}\mathbf{x} = \oint \Delta f \cdot \mathrm{d}\mathbf{x} \qquad \text{(Turning the triangle the right way up)}$$
$$= \int \circ\Delta \cdot f \, \mathrm{d}\mathbf{x} \qquad \text{(Rolling the circles around)}$$
$$= \int \text{🜂} f \, \mathrm{d}\mathbf{x} \qquad \text{(More rolling)}$$

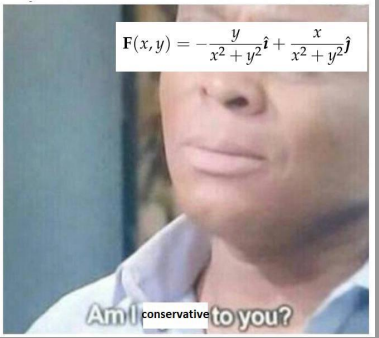
🜂 is the All Seeing Eye of the Illuminati: it is all powerful and all consuming; it is everything and it is nothing. Therefore

$$\infty = \text{🜂} = 0.$$

This completes the proof:

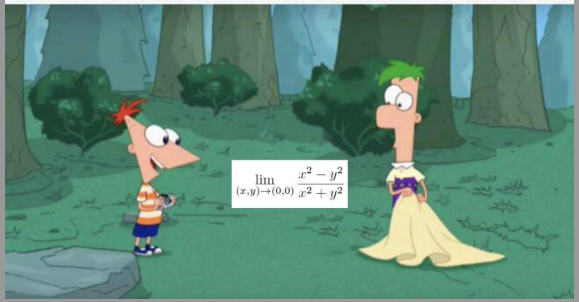
$$\oint \nabla f \cdot \mathrm{d}\mathbf{x} = \text{🜂} \int f \, \mathrm{d}\mathbf{x} = 0 \quad \square$$

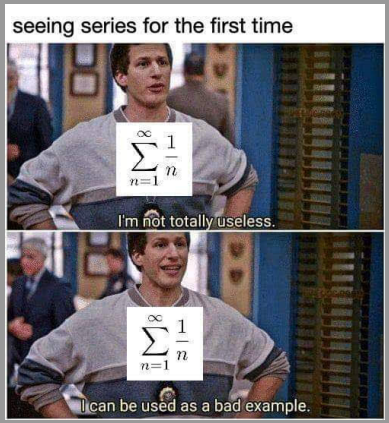
When you assume every vector field with zero curl is conservative without checking the domain



Section 7:
Limits


Discovering something that doesn't exist

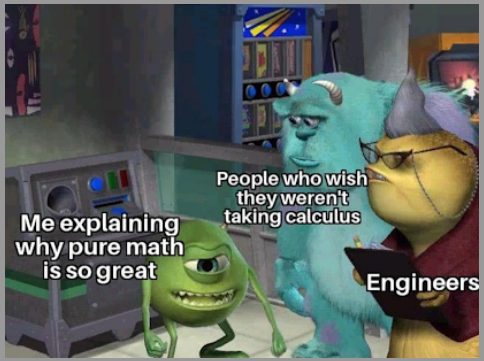

$\lim_{(x,y)\to(0,0)} \frac{x^2-y^2}{x^2+y^2}$


seeing series for the first time
$\sum_{n=1}^{\infty} \frac{1}{n}$
I'm not totally useless.
$\sum_{n=1}^{\infty} \frac{1}{n}$
I can be used as a bad example.

Section 2^3: Me

Students: use d/dx as a fraction

Aryaman:



Section 3^2: MA 105

This section has memes that I do not enjoy myself but I figured many of you may.

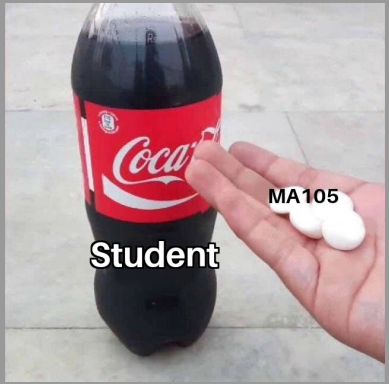

MA105
Me
Admission in IIT


Excited Freshies


MA105


Excited Freshies


MA105

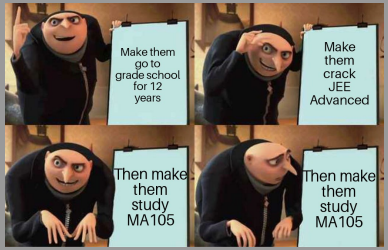

MA105
Student

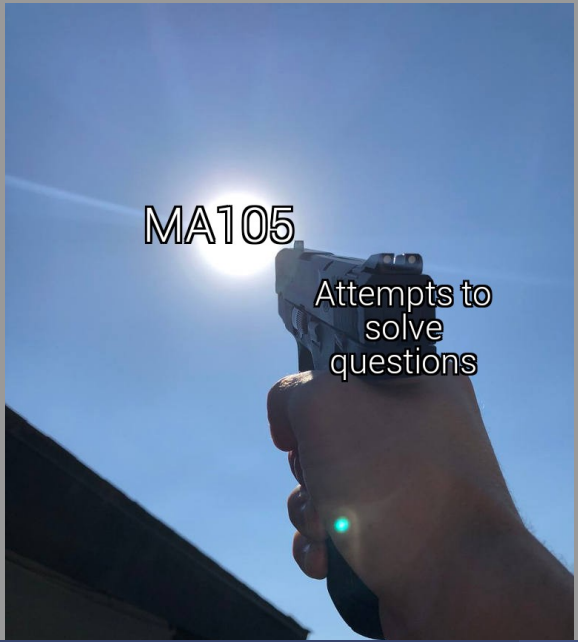

For every ε>0...
... there is a δ


Ye toh JEE wale tareke se ho jayega
that's where you're wrong kiddo

"Stop making memes and study for MA105"


FEAR NOT, LADY!
I'LL SAVE YOU!
KICK!
PROVE IT USING €-N DEFINITION
YEAH, SHE WAS ALREADY DEAD WHEN I FOUND HER
Infinipop Comics


Make them go to grade school for 12 years
Make them crack JEE Advanced
Then make them study MA105
Then make them study MA105


MA105
Attempts to solve questions


When MA 105 midsem is approaching fast and you haven't studied at all
GUESS I'LL MAKE MEMES


congratulations on admission in IIT Bombay
MA105

Farewell

Fin.