Math 300: Writing in Mathematics

John T. Baldwin

January 31, 2009

LOGISTICS

Webpage: www.math.uic.edu/$\tilde{\text{j}}$baldwin
email: jbaldwin@uic.edu
office hours: 11 AM T 11 AM W 1:00 PM Th; (tentative)
Assignments will be on the web.
There will be 3 essays (2 drafts of each and outline of 2nd two) and various short writing assignments. Some will be in class and some for homework.

Two types of plagiarism

Plagiarism of the word: direct unattributed use of another's exact expression.

Plagiagrism of the mind: direct unattributed use of another's ideas.

The McMahon Article

Discuss: Who stole what from who!

Person

What does first, second third person mean?
Why is this distinction important for writing?

Incorrect Compound Sentences

I am going home, I intend to stay there.

Incorrect Compound Sentences

I am going home, I intend to stay there.

It rained heavily during the afternoon but we managed to have our picnic anyway.

Incorrect Compound Sentences

I am going home, I intend to stay there.

It rained heavily during the afternoon but we managed to have our picnic anyway.

They couldn't make it to the summit and back before dark; so they decided to camp for the night.

Incorrect Compound Sentences

I am going home, I intend to stay there.

It rained heavily during the afternoon but we managed to have our picnic anyway.

They couldn't make it to the summit and back before dark; so they decided to camp for the night.

I am going home; and I intend to stay there.

Incorrect Compound Sentences

I am going home, I intend to stay there.

It rained heavily during the afternoon but we managed to have our picnic anyway.

They couldn't make it to the summit and back before dark; so they decided to camp for the night.

I am going home; and I intend to stay there.

It rained heavily during the afternoon; but, we managed to have our picnic anyway.

Incorrect Compound Sentences

I am going home, I intend to stay there.

It rained heavily during the afternoon but we managed to have our picnic anyway.

They couldn't make it to the summit and back before dark; so they decided to camp for the night.

I am going home; and I intend to stay there.

It rained heavily during the afternoon; but, we managed to have our picnic anyway.

They couldn't make it to the summit and back before dark so they decided to camp for the night.

Incorrect Compound Sentences

I am going home, I intend to stay there.

It rained heavily during the afternoon but we managed to have our picnic anyway.

They couldn't make it to the summit and back before dark; so they decided to camp for the night.

I am going home; and I intend to stay there.

It rained heavily during the afternoon; but, we managed to have our picnic anyway.

They couldn't make it to the summit and back before dark so they decided to camp for the night.

`http://owl.english.purdue.edu/handouts/grammar/g_commacomp.html`

Correct Compound Sentences: Comma

Use a comma after the first independent clause when you link two independent clauses with one of the following coordinating conjunctions: and, but, for, or, nor, so, yet. For example:

Correct Compound Sentences: Comma

Use a comma after the first independent clause when you link two independent clauses with one of the following coordinating conjunctions: and, but, for, or, nor, so, yet. For example:

I am going home, and I intend to stay there.
It rained heavily during the afternoon, but we managed to have our picnic anyway.
They couldn't make it to the summit and back before dark, so they decided to camp for the night.
`http://owl.english.purdue.edu/handouts/grammar/g_commacomp.html`

Correct Compound Sentences: Semicolon

Use a semicolon when you link two independent clauses with no connecting words. For example:

Correct Compound Sentences: Semicolon

Use a semicolon when you link two independent clauses with no connecting words. For example:

I am going home; I intend to stay there.
It rained heavily during the afternoon; we managed to have our picnic anyway.
They couldn't make it to the summit and back before dark; they decided to camp for the night.
`http://owl.english.purdue.edu/handouts/grammar/g_commacomp.html`

Derivation of Compound Interest formula

1 period: $A = P(1 + i)$
2 periods: $A = [P(1 + i)](1 + i)$
3 periods: $A = [P(1 + i)(1 + i)](1 + i)$
n periods: $A = P(1 + i)^n$

Continuous Compounding

Let i be the annual interest rate and n be the number of compounding periods per year. The amount after t years is:

$$A = P(1 + \frac{i}{n})^{nt} = P((1 + \frac{i}{n})^{n})^{t}$$

We want to know what happens as n tends to infinity.
What $\lim_{n \to \infty}(1 + \frac{i}{n})^{n})$?
Answer: e^{i}.

Fundamental Theorem of Calculus

If

$$F(x) = \int_1^x f(t)dt$$

then

$$F'(x) = f(x).$$

Calculating the Limit

This is too technical for the papers you are writing.

Definition $\ln x = \int_1^x \frac{1}{t} dt$.
By the fundamental theorem of calculus
Fact $\ln' x = \frac{1}{x}$
So $\ln'(1) = 1$.

But by the definition of derivative:

$$\begin{aligned} 1 &= \ln'(1) \\ &= \lim_{n\to\infty} \frac{\ln(1+\frac{1}{n}) - \ln 1}{\frac{1}{n}} \\ &= \lim_{n\to\infty} n(\ln(1+\frac{1}{n})) \\ &= \lim_{n\to\infty} \ln((1+\frac{1}{n})^n) \end{aligned}$$

So $1 = \ln \lim_{n\to\infty}((1+\frac{1}{n})^n)$
and therefore
$e^1 = \lim_{n\to\infty}((1+\frac{1}{n})^n)$.
Note that if we replace $1/n$ by $1/i$ and repeat the argument, we
$e^i = \lim_{n\to\infty}((1+\frac{i}{n})^n)$.