

---

# Technical Communication

## HW2

---

Yu Cang    018370210001

March 20, 2019

### 1 WRITING MATHEMATICS

As a final example, consider the triple compositions

$$f(x) = \int_a^{\left(\int_a^{x^3} \frac{1}{1+\sin^2 t} dt\right)} \frac{1}{1+\sin^2 t} dt, \quad g(x) = \int_a^{\left[\int_a^{\left(\int_a^x \frac{1}{1+\sin^2 t} dt\right)} \frac{1}{1+\sin^2 t} dt\right]} \frac{1}{1+\sin^2 t} dt,$$

which can be written

$$f = F \circ F \circ C \quad \text{and} \quad g = F \circ F \circ F.$$

Suppose  $F(x) = \int_a^x \frac{1}{1+\sin^2 t} dt$  and  $C(x) = x^3$ , we have

$$\begin{aligned} f'(x) &= F'(F(C(x))) \cdot F'(C(x)) \cdot C'(x) \\ &= \frac{1}{1+\sin^2 \left(\int_a^{x^3} \frac{1}{1+\sin^2 t} dt\right)} \cdot \frac{1}{1+\sin^2 x^3} \cdot 3x^2. \end{aligned}$$

Likewise, we have

$$\begin{aligned} g'(x) &= F'(F(F(x))) \cdot F'(F(x)) \cdot F'(x) \\ &= \frac{1}{1+\sin^2 \left[\int_a^{\left(\int_a^{\left(\int_a^x \frac{1}{1+\sin^2 t} dt\right)} \frac{1}{1+\sin^2 t} dt\right)} \frac{1}{1+\sin^2 t} dt\right]} \cdot \frac{1}{1+\sin^2 \left(\int_a^x \frac{1}{1+\sin^2 t} dt\right)} \cdot \frac{1}{1+\sin^2 x}. \end{aligned}$$

## 2 L<sup>A</sup>T<sub>E</sub>X

### 2.1 EXERCISE ON SLIDE 242

$$x_{4t}^{y+z}, \frac{y+\frac{3z}{2}}{b}, \sqrt[n]{\Omega}, \sum_{n=0}^{\infty} n, \int_0^1 \frac{1}{x} dx, \forall n \in \mathbb{N} \exists m \text{ such that } n-m=0$$

### 2.2 EXERCISE ON SLIDE 246

#### 1 Using package blindtext

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

$$\bar{x} = \frac{1}{n} \sum_{i=1}^{i=n} x_i = \frac{x_1 + x_2 + \dots + x_n}{n}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

$$\int_0^{\infty} e^{-\alpha x^2} dx = \frac{1}{2} \sqrt{\int_{-\infty}^{\infty} e^{-\alpha x^2} dx \int_{-\infty}^{\infty} e^{-\alpha y^2} dy} = \frac{1}{2} \sqrt{\frac{\pi}{\alpha}}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

$$\sum_{k=0}^{\infty} a_0 q^k = \lim_{n \rightarrow \infty} \sum_{k=0}^n a_0 q^k = \lim_{n \rightarrow \infty} a_0 \frac{1 - q^{n+1}}{1 - q} = \frac{a_0}{1 - q}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really?

Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-p \pm \sqrt{p^2 - 4q}}{2}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

$$\frac{\partial^2 \Phi}{\partial x^2} + \frac{\partial^2 \Phi}{\partial y^2} + \frac{\partial^2 \Phi}{\partial z^2} = \frac{1}{c^2} \frac{\partial^2 \Phi}{\partial t^2}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

## 2 Reproduce equations

$$\bar{x} = \frac{1}{n} \sum_{i=1}^{i=n} x_i = \frac{x_1 + x_2 + \dots + x_n}{n}$$

$$\int_0^\infty e^{-\alpha x^2} dx = \frac{1}{2} \sqrt{\int_{-\infty}^\infty e^{-\alpha x^2} dx \int_{-\infty}^\infty e^{-\alpha y^2} dy} = \frac{1}{2} \sqrt{\frac{\pi}{\alpha}}$$

$$\sum_{k=0}^{\infty} a_0 q^k = \lim_{n \rightarrow \infty} \sum_{k=0}^n a_0 q^k = \lim_{n \rightarrow \infty} a_0 \frac{1 - q^{n+1}}{1 - q} = \frac{a_0}{1 - q}$$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-p \pm \sqrt{p^2 - 4q}}{2}$$

$$\frac{\partial^2 \Phi}{\partial x^2} + \frac{\partial^2 \Phi}{\partial y^2} + \frac{\partial^2 \Phi}{\partial z^2} = \frac{1}{c^2} \frac{\partial^2 \Phi}{\partial t^2}$$

### 3 Vandermonde matrix

$$\begin{bmatrix} 1 & \alpha_1 & \alpha_1^2 & \dots & \alpha_1^{n-1} \\ 1 & \alpha_2 & \alpha_2^2 & \dots & \alpha_2^{n-1} \\ 1 & \alpha_3 & \alpha_3^2 & \dots & \alpha_3^{n-1} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & \alpha_m & \alpha_m^2 & \dots & \alpha_m^{n-1} \end{bmatrix}$$

#### 2.3 EXERCISE ON SLIDE 250

$$\tilde{E}(\omega) = \int_{-\infty}^{\infty} E_0 \sin(\omega_0 t) e^{-2i\pi\omega t} dt$$

$$\sin(x) = \frac{e^{ix} - e^{-ix}}{2i}$$

$$e^a e^b = e^{a+b}$$

$$\int_{-\infty}^{\infty} e^{it(x-x')} dt = 2\pi\delta(x-x')$$

$$\tilde{E}(\omega) = \frac{E_0}{2i} \int_{-\infty}^{\infty} e^{-2i\pi t(\omega - \frac{\omega_0}{2\pi})} - e^{-2i\pi t(\omega + \frac{\omega_0}{2\pi})} dt$$

$$\tilde{E}(\omega) = \frac{-2\pi^2}{i} E_0 [\delta(\omega - \frac{\omega_0}{2\pi}) - \delta(\omega + \frac{\omega_0}{2\pi})]$$

### 3 GROUP EXERCISE

I'm in Group 2, responsible for paragraph 4, 14 and 19.

#### 3.1 SUMMARY

In paragraph 4, the author mainly talks about the necessity, the advantage and the way towards a well-organized structure. Organization is the core competence of a book. A clear structure helps readers follow the logic and understand easily. Writers need to prepare an outline at first, which may take a long period, and then decide what are around the kernel and put them in.

In paragraph 14, the author indicated the importance of using technical terms correctly and gave 3 examples explaining it. It's better not to use newly created words, and use old ones instead.

In paragraph 19, the author suggests writers to stop, without hesitation, after writing, not to worry about minor modifications. Some tips were provided for checking the manuscripts quickly.

#### 3.2 REMARKS ON PEER'S WORK

##### (a) Remarks on Shuixin Xiao's summary

Statements are both clear and specific and core parts are described. No spelling mistakes nor grammar errors.

(b) **Remarks on Yijie Wang's summary**

It's a quite good summary as most aspects in the paragraphs are covered. Author's idea are exactly conveyed, no spelling mistakes nor grammar errors.

(c) **Remarks on Yaoxia Shao's summary**

This summary is quite pertinent, and main idea of original paragraphs are explained. No spelling mistakes nor grammar errors.

### 3.3 DISCUSSION

This part is submitted by Xiao Shuixin, whose student ID is 018370910023.

## 4 GRAMMAR

### 4.1 PLURALS OF GIVEN WORDS

- (a) means: means
- (b) paralysis: paralyses
- (c) curriculum: curricula/curriculums
- (d) oasis: oases
- (e) offspring: offspring/offsprings
- (f) criterion: criteria/criterions
- (g) Chinese: Chinese
- (h) antenna: antennae/antennas
- (i) stimulus: stimuluses/stimuli
- (j) fungus: fung/funguses
- (k) alumnus: alumni
- (l) series: series
- (m) diagnosis: diagnoses
- (n) vita: vitae
- (o) American: American
- (p) synopsis: synopses

#### 4.2 FILLING THE BLANKS

- (a) The Decline and Fall of the Roman Empire
- (b) The complexity of the problem of the decline and fall of the Roman Empire is made evident by a wide variety of causes that are emphasized in varying degrees by \_\_\_\_\_ different authors.
- (c) Fortunately, a concise formulation of Edward Gibbon serves as a widely accepted basis for \_\_\_\_\_ modern discussion of the problem.
- (d) According to Gibbon, the empire reached its peak during the administration of \_\_\_\_\_ two Antonines.
- (e) After that, however, the extent of \_\_\_\_\_ Roman conquest became too great to be managed by \_\_\_\_\_ Roman government, the decline began.
- (f) The military government was weakened and finally dissolved as \_\_\_\_\_ barbarians were allowed to constitute an ever-growing percentage of the Roman legions.
- (g) The victorious legions began to dominate and corrupt the government, weakening it at the time when it most needed a strength to overcome \_\_\_\_\_ other problems.