

ANGLIČTINA PRO MÍRNĚ POKROČILÉ 3



Mgr. JANA KOVÁŘOVÁ, Ph.D.



**FAKULTA
JADERNÁ
A FYZIKÁLNĚ
INŽENÝRSKÁ
ČVUT V PRAZE**

**KATEDRA
HUMANITNÍCH
VĚD A JAZYKŮ**

PRAHA 2024

UNIT 1

FORMAL WRITING

PART 1

FORMAL LETTERS/E-MAILS

I. Discuss in pairs:

- What ways of written communication can you think of? What are the differences between them?
- Which of the ways do you use?
- How often do you write e-mails? Who do you usually write them to and why? Are these e-mails formal or informal?

II. Work in pairs. Read your text and tell you your partner about it. Compare the information in your texts.

III. How to write a letter of application? Think of the style, contents, structure and layout.

IV. Study the samples of cover letters below. Compare them with your ideas in task III. Which parts should be skipped in e-mails?

Sample cover letters

59 River Street,
Cardiff,
CF1 1JW

1st March 2022

The Editor
The Swansea Gazette
27 New Hall Road
Swansea
3GT IDR

Dear Sir or Madam,

I would like to apply for the post of trainee reporter which was advertised in yesterday's edition of the Swansea Gazette.

I am eighteen years old and will be leaving school at the end of this academic year. Presently I am studying English and Economics for my A levels.

I have been involved in the production of my school's newsletter for the last two years and I have a keen interest in local affairs. I am also a member of the football and athletics teams.

I enclose the names and addresses of two referees who can testify to my conduct and character.

I could come for an interview at any time which is convenient to you.

I look forward to hearing from you.

Yours faithfully,

Mark Morrison

Lípová 36
Prague 3
130 00
Czech Republic

2 April 2023

The Employment Officer
Home and Overseas Airways Ltd.
43, Park Lane
London WJ 1 9PN
Great Britain

Dear Sir,

In reply to your advertisement in "Go By Air" of March 29th, I would like to apply for the position of air hostess.

I have travelled by air frequently and observed the work of air hostesses with interest. I believe I am suited for the job and would enjoy it.

At present I am completing a two-year course at the Modern Language School in my hometown, where I am learning English, French, and German and I am preparing for my final examinations (FCE, DALF, and ZD respectively). I also learned Spanish at secondary school which I finished two years ago.

In my past holiday jobs I worked as a waitress, which required quick and pleasant service. I have also taken a course in first aid. Playing tennis, swimming, and skiing have added to my good health and stamina which I assume are essential for the work of air hostess.

I enclose my curriculum vitae including more details about my education and skills. Should you need further information about my character, the headmaster of my present school and my former teachers would be willing to give me references.

I would be happy to come for an interview at your convenience.

I look forward to hearing from you.

Yours faithfully,

Linda Louková

13 Clive Road
London
SE 21 8TZ

3rd of June, 2022

Kate Best (ref 818/03)
Human Resources
Axcom
19 Cumberland Drive
London WA2 2EH

Dear Ms Best

I am writing to apply for the position of Human Resources Manager as advertised in the Financial Times of 1 June 2022.

My experience and qualifications match those requested in your advertisement. I am also familiar with Axcom's products, and I am confident that I can help you to implement your European human resources strategy successfully.

As you will see from my CV, I have more than five years' experience in developing HR strategies, mainly in software companies. I also have extensive experience of leading international project teams, and excellent knowledge of the French, German, and Spanish markets. I speak both German and French fluently.

For the past three years, I have been working as deputy director of HR at DVP Systems in Bromley. During this period, I was responsible for implementing the financial module of SAP and coordinating HR policies with our partners in Germany, France and Spain.

I would be happy to discuss salary matters at an interview and would be grateful if you would let me know if you intend to take up my references.

Thank you for considering my application. I look forward to hearing from you.

Yours sincerely

Michael Hunt

Moravská 56
120 00 Praha 2
Czech Republic

16 May 2024

The Personnel Officer
Construction Ltd.
PO Box 346, Glasgow G 129 QT
Scotland

Dear Sir / Madam,

In answer to your advertisement in the Education Supplement of The Scottish Express on 15 May 2024, I should like to apply for a holiday job with your company.

I am studying Civil Engineering at the Czech Technical University in Prague in my third year and have passed all my exams with distinction. I have a working knowledge of English and would welcome the opportunity to be in an English-speaking environment so that I become more fluent.

Naturally, from a professional point of view I would very much appreciate working with your firm, which would provide me with valuable experience for my future career.

I am 21 years old, enjoy good health and like meeting new challenges.

I would very much appreciate if you would consider my application and look forward to hearing from you.

Yours faithfully,

Josef Novák

Josef Novák

EXERCISES – FORMAL LETTERS / E-MAILS

I. Complete the following letter of application.

<p>Alexandra Schmidt Patagonia GmbH Museumstrasse 20 7000 Munich22 Germany</p>	<p>Sheila Britton 2 Endon Drive Chorlton, Manchester M21 7TE England UK</p>
<p>8th January 2023</p>	
<p>Dear Ms Schmidt,</p>	
<p>I am writing tofor the position of Public Affairs Assistant which was last week in the International Herald Tribune.</p>	
<p>Although I am presently by a non-profit making organisation, it has always been my intention to work in a commercial environment. I would particularly the chance to work for your company and as you will in my enclosed curriculum vitae, the job you are offering both my personal and professional interests.</p>	
<p>My work experience has familiarised me with many of the challenges in public relations today. I am sure that this, together with my understanding of the needs and expectations of sport and nature enthusiasts, would be extremely relevant to the position. Moreover, as my mother is German, I am fluent in this language and would definitely working in a German-speaking environment.</p>	
<p>I would be pleased to my curriculum vitae with you in more detail at an interview. In the meantime, please do not hesitate to me if you require further information.</p>	
<p>I look forward to hearing from you.</p>	
<p>Yours sincerely,</p>	
<p>Sheila Britton</p>	

II. In each of the following sentences, choose the most appropriate word from the options in brackets.

1. I am writing to (*apply, request, ask*) for the post of Sales Consultant advertised in today's edition of "The Independent".
2. I enclose my curriculum vitae for the (*job, position, work*) of Program Manager.
3. As you will see from the enclosed (*curriculum vitae, covering letter, application*), I have had several years' experience of Export Sales.
4. I (*qualified, left, graduated*) from Manchester Technical College with an HND in Electronic Engineering.
5. At present, I am (*worked, employed, taken*) by Unisys, where I work in the customer Service Department.
6. I would be grateful if you could send me an application (*form, formula, card*).
7. While I was at Dell, I was (*responsible, charged*) for the day-to-day running of the Technical Services Department.
8. At ICL my duties (*included, added, completed*) installing and testing new computer systems.
9. I look (*forward, ahead, on*) to hearing from you.

III. Correct common mistakes:

in/with the reference to Your advertisement...	I absolved the University of...
the position/post of the Design Engineer	I have an Engineering diploma
in reply to your letter from 10 December	I am studying Bc degree

IV. With a partner prepare a set of instructions on how to write a good cover letter (e-mail). Use impersonal language (i. e. avoid using 'I', 'we', 'you' etc.). Do not use imperative. You may use some of the following words and expressions:

addressee - at the bottom of the page - at the top of the letter - body of the letter - comma - in the right(handside) upper corner of the page - paragraph - salutation - sender - signature

COVER LETTERS

I. USEFUL PHRASES

Salutation

close

Dear Sir, Dear Sirs, US usage = Gentlemen:	(all followed by)	Yours faithfully,
Dear Sir or Madam,		
Dear Mr Brown Dear Professor Smith	(all followed by)	Yours sincerely

Introduction

<p>I am writing in reply to your advertisement published in</p> <p>With reference to your advertisement infor the position of</p> <p>I am writing to apply for</p> <p>I wish to apply for</p> <p>I am applying for the post of</p>
--

The body of the letter

<p>I feel that my qualifications match your requirements</p> <p>I feel I would be suitable for this post because</p> <p>My qualifications are as follows:</p> <p>I wish to gain experience of</p> <p>Having already worked as a for, I wish to extend my experience</p> <p>....., I feel I could be useful to you</p>
<p>I enclose my CV</p> <p>Please find enclosed the names and addresses of my referees</p>
<p>I could come for an interview at any time which would suit you.</p> <p>..... at your convenience</p> <p>I am available for an interview</p> <p>I would be glad to attend an interview</p>
<p>I look forward to hearing from you.</p>

II. USEFUL VOCABULARY

VERBS		ADJECTIVES		NOUNS
act as	implement	adaptable	sensitive	oral and written communication skills extensive experience in excellent knowledge of the ability to work in multicultural teams leadership skills
carry out	introduce	adept	tactful	
create	negotiate	committed		
develop	raise	conscientious		
devise	redesign	dependable		
establish	reduce	enterprising		
exceed	set up	loyal		
expand	supervise	outgoing		
graduate		reliable		
head		resourceful		

USEFUL PHRASES FOR FORMAL AND BUSINEES LETTERS

Opening phrases

We thank you for your letter of 3rd August.
 Many thanks for your offer of 3rd August.
 We refer to your letter of 3rd August
 In reply to your letter of August 3rd we wish to inform you that

With/In reference to your letter of August 3rd we wish to let you know that

We confirm our email of August 3rd running as follows:

Phrases announcing

a neutral fact:

We wish to
 We would like to
 We have to

a pleasant fact

We are pleased to
 We are glad to
 We are happy to
 We have the pleasure to

an unpleasant fact

We are sorry to
 We regret to
 Unfortunately we have to point out that

- inform you that
 - let you know that
 - say that
 - tell you that

Polite requests

Please send us

We ask you kindly to send us

We request you to send us

Can you send us

Could you please send us

Will you kindly let us know

Would you kindly let us know

We shall be grateful if you will let us have
 would let us have

Closing phrases

We are looking forward to an early reply.
 receiving a favourable reply.
 We look forward to hearing from you.
 We hope to hear from you soon.
 We await your reply as soon as possible.

PART 2

FORMAL WRITTEN COMMUNICATION – REQUESTS AND SUGGESTIONS, BUSINESS E-MAILS

I. Look at the list of sentences and expressions below. What do you notice about those in the left-hand column?

Send me a brochure.	I would like to ...
I want a ticket for tonight's show.	I am very interested in ...ing
I think you should employ more staff.	Could I suggest that ...
You should give up smoking.	Please avoid ...ing
In my opinion you should improve your service.	Wouldn't it be better if you ...
I want to get a place at your school.	I would be grateful if you/I could ...
I can't stand your car alarm.	Please would you ... / Could you please ...
You park your car too close to mine.	I would recommend that you ...
Why is your information always out-of-date?	I would appreciate it if ...

II. Rewrite the phrases in a formal style.

Informal (spoken) language:

- | | |
|--|--|
| 1. Thanks for your letter | 7. What exactly do you need? |
| 2. I've just seen your advert in | 8. Just send the stuff back. We'll pay. |
| 3. Can you tell me about ...? | 9. I've got some bad news. There's no more until next month. |
| 4. because | 10. Good news! I've just heard that |
| 5. Sorry I can't make the meeting. | 11. There isn't much left. You better move fast. |
| 6. Here are | 12. If you'd like any more details, just let me know. |

III. Study the following text to know the basic steps in a business transaction:

A BUSINESS TRANSACTION

Buying a bus ticket or calling at the butcher's to buy a beefsteak are matters of everyday life, but in each case the buyer and the seller have entered into a **contract**, i.e., into a legally binding agreement. In these two cases the transactions are, however, so simple that there is little room for mistake.

But in business, transactions are usually much more complex. The task of obtaining supplies for a company is therefore usually placed in the hands of specialists in the purchasing department. Similarly, the sales department is in charge of selling the products of the company on home or foreign markets. These departments co-operate with a number of others such as the advertising dept., cost dept., invoice dept., transport dept., etc.

Most business transactions start either by an **enquiry** on the part of a **buyer** who is in need of some products, or by an **offer** on the part of a **seller** who wants to sell because he wants to get back the money he had invested in the manufacture or in the purchase of some commodities. Both the enquiry and the offer usually state the price of the goods and the terms on which the transaction is to be concluded.

If the price and the selling conditions are acceptable to both parties, the buyer places an **order** with the seller, who in turn sends the buyer a **confirmation of his order**. In the confirmation he expresses agreement with the terms of the order and binds himself to fulfil them.

When nothing goes wrong, the seller gets the goods ready for dispatch when the time of **delivery** approaches, he arranges for the **insurance** and transportation of the goods if this has been agreed upon, and he **dispatches** the goods to the **place of destination**. He then sends the necessary documents to his bank, which presents them to the buyer's bank for **payment**.

Sometimes the buyer is not satisfied with the execution of the order, and he makes a **complaint**. In such a case it is in the interest of both parties to examine the matter and settle it to their mutual satisfaction as quickly as possible.

IV. Rewrite the following phrases as sentences for a business letter. Some words have been given to help you:

1. It's about that ad we saw in Marketing Monthly. (*writing, reference to, recent edition*)
2. Can you send us something about what your company sells? (*grateful, information, range*)
3. Thanks for your letter of March 12 asking about what we sell. (*dated, enquiring, products*)
4. I have some bad news. I'm afraid your order is going to be late. (*regret, inform, delayed*)
5. See you in Frankfurt next month! (*look forward*)

V. Rewrite the sentences below in a clear, simple, positive style appropriate for a business letter:

1. Thanks for your letter – sorry I didn't get in touch until now. Well, about your problem with the machine – it's not our fault. You obviously didn't follow the instructions – that's why it's broken.
2. You want to claim for it under your guarantee? Don't remember – you didn't renew your maintenance contract last year. Anyway, someone from our Service Dept. will contact you some time to talk about when our engineers are coming.
3. I'll be here if you want a chat.

VI. Look at the following task and the sample answer below. Discuss the answer with a partner. Then rewrite the answer in a more appropriate way.

TASK

Write an e-mail responding to the advertisement below. You have always wanted to take part in an expedition like this one but would like to have more information. Read the advertisement carefully and the notes which you have made below. Then write your e-mail.

OPERATION SEA GULL
Chance of a Lifetime!

If you want to see the world, visit exotic places, make new friends and work hard as part of a team, this could be just the opportunity you've been looking for.

Operation Sea Gull sets sail on November 15th and currently needs:

- marine biologists/anthropologists/geologists
- enthusiastic crew members (no previous sailing experience necessary)

The voyage will last for approximately 6 months and will include research into the animal and plant life of Indonesia

- any qualifications needed?
- cost?
- what need to take?
- exact date of return?

REPLY

Dear Sir/Madam,

I was really thrilled to see your super advertisement in Eco Magazine yesterday. I've always wanted to go on a sea voyage ever since I was little, and this looks like it could be my big chance.

There are just a few little points that crossed my mind. First of all, I was just a bit worried that I might need some special qualifications or something. Another thing was that you didn't say if we would have to pay anything and I'm actually a bit short of cash at the moment, you know how it is.

If it was alright with you and I did come, my mum wanted me to ask what I would need to bring but I suppose you have some kind of list, don't you? Oh yes, and the other thing was... when exactly do you think we'll be back because I really fancy doing a Spanish course next summer and I can't book it without knowing when we're getting back.

Well, I can't wait to meet everyone. Do write back soon and let me know what's next!

See you soon,

Julio

VI. In each of the following sentences, choose the correct word to fill the gap:

1. I would be if you could send me details of your PS/2 engines. (*thankful / please / grateful*)
2. You were to us by our associates. (*suggested / recommended / informed*)
3. We were given yourby the Chamber of Commerce. (*identity / company / name*)
4. Thank you for your letter19 June. (*on / of / from*)
5. Please enclosed our current catalogue and price list. (*find / look / receive*)
6. We would appreciateyou could send us further information on your range of non-impact printers. (*it that / this / when / it if*)
7. I would we grateful if you could arrange for your Technical Directoron me. (*will call / is calling / to call / calls*)
8. We look forwardfrom you. (*hear / to hear / hearing / to hearing*)
9. We would be grateful an early reply. (*to / of / for / with*)
1. Should you require anything further at this time, please do notto contact me. (*avoid / hesitate / delay / prevent*)

USEFUL PHRASES FOR FORMAL AND BUSINEES LETTERS

Expressing feelings in formal letters

Dissatisfaction/dislike	Regret/apology	Needs/wants/desires
I am unhappy about / do not like...	I am sorry that I	What I am looking for is...
I am not comfortable about/with...	I regret that I...	What would suit me best is...
... is not what I expected /was expecting	Please accept my apologies for ...ing	I am very keen to...
... does not suit me / my needs	Please forgive me for...	I would very much like to...
... is too + adjective	Unfortunately / Regrettably I...	I would be grateful if you could...
Gratitude	Annoyance	Pleasure/satisfaction
Thank you very much for...	Although I stated that...	I was delighted about/by...
I very much appreciated...	Despite my request for...	I thoroughly enjoyed...
I am grateful to you for...	Even though I telephoned you about...	... was very impressive/enjoyable

VII. Business letter 1 - enquiry

Read the following letter. Fill in each gap with the correct word from the offer:

attention - based - faithfully - forward - graphics - Madam - Project - protecting - sell - send - together

PHYSIOLOGICA

17 Princess Street

London

Telephone 071 982 7111

Fax 071 982 7712

Our ref: AN/JS

1 July 2000

DISPRO SA
251, rue des Ramonieres
F – 86256 Poitiers Cedex
France

For the of the Sales Manager

Dear Sir or

We are a software company in London and are currently developing a Windows – based scientific package for use in universities and research laboratories. We are interested in the programs we from unauthorized copying and duplication.

Could you please us more information about your RSP-11 software protection system with your current brochure and price list?

We look to hearing from you.

Yours

Anne Newson
.....Director

VIII. Business letter 2 – reply to enquiry

Complete the following letter by filling in the correct prepositions. Some of them will be used more times.

for - from - in - of - on - to - with

DISPRO SA

Tel. 331 9968 031

251, rue des Ramonieres

F – 86256 Poitiers Cedex

France

5 July 2000

Ms Anne Newson
Project Director
Physiologica
17 Prince Street
London EC1 7DO
UK

Dear Ms Newson

Thank you your letter 1 July which you expressed an interest the RSP 11 software protection system. Please find enclosed our latest brochure and price list.

From the information your letter, I can confirm that the range of products we supply would be ideal your needs. particular, I would like to draw your attention the RSP 11W page 3 which is designed for software protection in both Windows and O/S environments.

As you will see, our protection systems are tailored individual programs. Please let me know whether you would like to arrange a meeting our Technical Director, Mr Michael Gerard, to prepare a more detailed report your program and particular requirements. He will be in London during the week beginning 15 July.

I look forward to hearing you.

Yours sincerely

P. Varenne
Sales Manager

UNIT 2

ARTICLES

SPECIAL CASES IN THE USE OF THE DEFINITE ARTICLE

by Martine Johnson, International Student Centre, University of Toronto

To decide if you should use the word *the*, ask yourself these three questions:

1. Is the noun indefinite (unspecified) or definite (specific)?

The general rule states that the first mention of a noun is indefinite and all subsequent references to this noun are definite and take *the*:

A man is walking down a road. There is a dog with *the* man.

The second mention may be a synonym:

Combine butter, sugar and eggs. Add flour to *the* mixture.

First (indefinite) mention requires *a* or *an* for a singular count noun, no article for a plural or non-count noun. Second mention makes *the* correct for both count and non-count nouns:

A growing plant must have water and minerals. *The* plant must also have sunlight. *The* minerals must include nitrates and *the* water must not be saline.

Three **special groups of nouns** are considered definite in reference even if they have not been mentioned in the preceding sentence or clause.

- a) The first group consists of nouns which refer to **shared knowledge of the situation or context**.

For example, in Canada you can say

The Prime Minister will arrive tomorrow

because there is only one Prime Minister in Canada, and so it is clear to whom you are referring. Similarly, if there is only one hospital in the town, you can say

He's been working in *the* hospital for two years.

But you couldn't say this in Toronto, where there are many hospitals. You would have to name the particular hospital in your first reference to it:

He's been working at Toronto General Hospital for two years. He says *the* hospital is in a financial mess.

- b) The second group consists of nouns referring to **unique objects**:

e.g., *the* sun/*the* earth/*the* Pope/*the* sky/*the* equator

- c) **Superlative adjectives and unique adjectives** form the third group. Because there can be only one of these (only one of a series can be the tallest or the best or the first), they take the definite article:

Tokyo is *the* most populous city in the world.
I enjoyed *the* first part, but I was disappointed at *the* end.
She is *the* principal researcher.

2. Is the noun modified?

- a) **Premodification:** If the noun is preceded by one of the following –
this/that/these/those/some/any/each/every/no/none/my/mine
do not use the definite article.

e.g., the red books/some red books/no red book/his red books/each red book

- b) **Postmodification:** if the noun is followed by a relative clause (*who/which/that*) or a prepositional phrase (*of/in/to...*), **it is made definite and takes the definite article.**

The man who lives next door is Chinese.

We take the regular collection of garbage for granted.

The journey to Vancouver takes three days by train.

No one expected the results that were found.

EXCEPTION: collective nouns take the indefinite article:
a box of matches/a deck of cards/a bar of soap/a herd of cows.

3. Is the noun generic?

Generic reference is used when one refers to a whole group or class, to generalize about all possible members of a group. There are five patterns one can use:

- a) no article PLUS plural count noun:
It's astonishing what gymnasts can do.

- b) no article PLUS noncount noun:
Love can cause a lot of suffering.

- c) indefinite article PLUS singular count noun:
It's astonishing what a gymnast can do.

[This pattern cannot be used to discuss the location or existence of something/someone. You cannot say *A lion lives in Africa*. You must use pattern (a) or (d)].

- d) definite article PLUS singular count noun:
It's astonishing what the gymnast can do.

- e) definite article PLUS plural nationality noun:
The Chinese have an ancient culture.

Pattern (a) is most common in colloquial English; pattern (d) is frequently use in academic writing.

Special Uses of Articles

a) Proper nouns

Proper nouns, because they are the names of people or places, are already specific and so do not need to be made more specific by the definite article. So we say “John,” not “the John,” and “Canada,” not “the Canada.” (There are one or two anomalous usages in place names: e.g., “the Netherlands,” but “Holland.”) This rule explains why we say “Boyle’s Law,” not “the Boyle’s Law,” and “Planck’s constant” but not “the Planck’s constant.” Sometimes, however, a proper noun is used as an adjective, and adjectives **do not** affect the decision to use the article with the noun. You must look at the noun in order to know whether or not to use the definite article.

Japan’s financial problem — *Japan* is a proper noun. No article.

X

the Japanese financial problem — *Japanese* is an adjective. Look at the noun to decide if there should be an article: *problem* is general and must be made specific by using “the.”

X

Japanese financial problems — *Japanese* is an adjective. Look at the noun. It is plural, so refers to all problems in general. No article.

Smith’s book on Japan — *Smith* is the proper name of the person. No article.

X

the Smith book on Japan — *Smith* is used as an adjective modifying the noun *book*. *Book* is general, and must be made specific by using the article. **(If the name is possessive, it is a proper noun. If not, it is acting as an adjective.)**

b) Media and communications:

Use a noun PLUS definite article to refer to **systems** of communication and the mass media, in contrast to the actual machine of communications. *The* telephone is the system of communication; *a* telephone is the actual physical machine.

The newspapers are all in agreement on the latest financial disaster.

EXCEPTION: *television* usually has no article: *Did you see him on TV?*

c) Means of transportation:

Use the definite article to refer to the whole transport system, rather than to an individual vehicle:

How long does it take on the bus?

The subway is quicker.

[if you use the construction “by PLUS means of transport,” there is no article: *I go by subway*].

d) Forms of entertainment:

To refer to a form of entertainment in general, use the definite article:

I enjoy seeing the ballet.

To refer to a particular event, use the indefinite article:

I saw *a* good movie last night.

e) Place/object or activity nouns:

Certain nouns refer to either a place/object or to an activity. When they refer to an activity, do **not** use the definite article:

ACTIVITY

I go to *bed* at 11 o'clock.

She went to *school* for many years.

Many families eat *dinner* together.

I shower before *breakfast*.

They are at *church*.

She is in *class*.

OBJECT

Don't jump on *the bed*.

The school was too

small. *The dinner* was

delicious.

The breakfast was delicious.

The church is very old.

The class is in Room 102.

f) Directions:

Nouns indicating direction do not take the definite article:

Go two blocks *south* and turn *left*.

[exception: nouns indicating political divisions take the definite article: She is on *the* left of the party.]

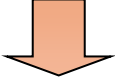
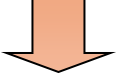
g) Periods of time:

Names of decades, centuries and historic periods take the definite article, as they are a form of unique reference:

The 1960s were a time of student rebellion.

Taken from: <https://advice.writing.utoronto.ca/english-language/definite-article/>

THE ARTICLES: SPECIFIC X GENERIC REFERENCE

	SPECIFIC	GENERIC
sg	There is a microscope in each room. The microscope is used in our experiments.	A microscope is a useful instrument. The microscope is a useful instrument.
pl	There are microscopes in each room. The microscopes are used in our experiments.	Microscopes are useful instruments
	X two different pieces of information 	= the same piece of information 
	The sentences refer to a specific microscope or to specific microscopes. The difference between the singular and the plural, and between indefinite and definite article, is important.	The sentences refer to a whole group of similar objects . In the category of countable nouns, one item represents the whole class. There is no difference in meaning between the singular and plural. In the singular, both a and the can be used.

EXERCISES – ARTICLES

1. Explain the differences between the following sentences.

- a) **___ paper based system is very time consuming and error prone.**
 A paper based system...
 The paper based system...
 Paper based systems...
- b) **EDI can suffer more from ___ breakdown than the manual system.**
 EDI can suffer more from a breakdown ...
 EDI can suffer more from the breakdown ...
 EDI can suffer more from breakdowns ...
- c) **It is ___ museum's task to explore contemporary culture.**
 It is a museum's task...
 It is the museum's task...
- d) **Is the heating on?**
 Modern electric cookers use induction heating.
 They invested a lot of money in the new heating.

II. Fill in articles as appropriate.

1. _____ light travel faster than _____ sound.
2. What is _____ highest mountain in the world?
3. _____ antelope runs faster than _____ horse.
4. Doctor Black is _____ head of the Biochemical Department.
5. _____ furniture in this room is all new.
6. Such _____ information is of _____ great importance.
7. _____ fingerprints on the gun were _____ main evidence against him.
8. _____ British bank sector.
9. We have _____ same problem.
10. They are going to face _____ similar situation _____ next year.
11. At _____ first, I didn't like him.
12. The car travelled at _____ speed of 90 kilometres.
13. He grew up in _____ 1980s.
14. It takes 30 minutes on _____ train.
15. Her daughter is at _____ school.
16. Did you lock _____ door?
17. _____ American whom we met _____ last week was difficult to understand.
18. I dropped _____ coin into _____ machine. _____ coin came out again.
19. I wouldn't like to work under this kind of _____ manager.
20. What make of _____ car is your favourite?
21. It is _____ real pleasure to see you again.
22. There was _____ heavy fog last night.
23. He behaved in _____ most indiscreet way. (= nanejvýš)
24. Can you play _____ violin?
25. Does Mr. Brown hold _____ degree of _____ PhD?
26. _____ intelligence of these children is very high.
27. Who is _____ inventor of _____ telephone?
28. My colleague has been offered _____ position of _____ Production Manager.
29. Do many people in _____ Czech Republic go to _____ university?
30. Do you have _____ university degree?
31. We have to protect _____ environment.
32. She is _____ member of the committee.
33. _____ man _____ police are looking for used to live near here.
34. What kind of _____ film do you want to watch?

III. Read the following passage and fill in the articles as appropriate.

The differences in wildlife between island and mainland

The differences between island and mainland are of (1) _____ two kinds: on any island there are fewer species than on (2) _____ mainland and in any species living in both places (3) _____ population on (4) _____ island tends to be slightly different from that on (5) _____ mainland. (6) _____ first difference has, at first sight, (7) _____ obvious cause – any offshore island will be smaller than (8) _____ mainland and therefore have less room for (9) _____ plants and (10) _____ animals. However, (11) _____ difference goes deeper than this, for (12) _____ islands not only have (13) _____ smaller total number of (14) _____ species upon them but also (15) _____ smaller number of (16) _____ species per unit area than (17) _____ mainland. This would not have been so when England was physically joined to Europe. Once the Channel

was formed, however, (18) _____ populations of wildlife in England cut off from France must have suffered many ups and downs and some died or were killed, like (19) _____ beaver and (20) _____ wolf. Despite the Channel, however, (21) _____ colonist did arrive like (22) _____ rabbit and (23) _____ pheasant. Hence (24) _____ number of (25) _____ kinds of (26) _____ animals existing on (28) _____ island depends on (29) _____ balance being struck between (30) _____ rates of (31) _____ two processes, (32) _____ extinction and (33) _____ colonization. (34) _____ rate of (35) _____ extinction will depend mainly upon (36) _____ size of (37) _____ island and (38) _____ amount of (39) _____ room allowed for wildlife, since the smaller (40) _____ population the more likely it is to become extinct, while (41) _____ rate of (42) _____ colonization will depend upon how far (43) _____ island is from (44) _____ mainland.

Thinking on (45) _____ same lines can also produce (46) _____ reasons for (47) _____ second kind of (48) _____ difference: (49) _____ differences between (50) _____ populations of (51) _____ same species living on (52) _____ island and on (53) _____ mainland. There is (54) _____ good chance that (55) _____ new colonist from (56) _____ mainland, which succeeds in founding (57) _____ island race, will be different from its siblings which remain at home, it will at least be more adventurous. There will also be fewer individuals making up (58) _____ populations on (59) _____ island, so to some extent (60) _____ inbreeding must take place. However, even if (61) _____ colonist is not different, (62) _____ subsequent generations may become so since many competitors will be left behind on (63) _____ mainland and (64) _____ new situations for (65) _____ feeding and (66) _____ breeding will be available on (67) _____ island. (68) _____ island population will evolve into (69) _____ distinct race to take advantage of these new situations.

UNIT 3

MATHEMATICS

PART 1

NUMBERS

I. How do you say the following numbers? Choose the correct option.

1. The year 2005:
 - a) twenty hundred and five
 - b) two thousand and five
 - c) twenty-five
 - d) twenty hundred five
 2. £ 1 = CZK 29.78
 - a) twenty-nine point seven eight Czech crowns to the pound
 - b) twenty-nine seventy-eight Czech crowns for a pound
 - c) one pound equalling Czech crowns twenty nine point seven eight
 - d) one pound making twenty-nine point seven eight Czech crowns
 3. The period from about 1994 to about 1996:
 - a) the midnineties
 - b) the medium nineties
 - c) the middling nineties
 - d) the midway nineties
 4. Seven correct answers in a test of ten items. The result is:
 - a) seven over ten right
 - b) seven out of ten right
 - c) seven on ten right
 - d) seven right over ten
 5. The dimensions of a rectangle 3 metres in length and 2 metres in width:
 - a) three for two
 - b) three by two
 - c) three times two
 - d) three to two
 6. The result of an opinion survey:
 - a) One of ten people thin that...
 - b) One in ten people think that...
 - c) One to ten people think that...
 - d) One over ten people think that...
 7. Approximately six:
 - a) nearly six
 - b) six-ish
 - c) sixty
 - d) sixer
 8. At football, Germany 0, Brazil 0:
 - a) Germany oh, Brazil oh
 - b) Germany zero, Brazil zero
 - c) Germany nil, Brazil nil
 - d) Germany and Brazil love
 9. 3 cm^3 :
 - a) three centimetre cubes
 - b) three cubic centimetres
 - c) three cubed centimetres
 - d) three centimetric cubes
 10. 3:2 as a ratio:
 - a) three over two
 - b) three under two
 - c) three to two
 - d) three at two
- A \$10m loan:
 - a) a ten-million-dollars loan
 - b) a ten-million-dollar loan
 - c) a ten millions of dollars loan
 - d) a loan of ten million dollar

Remember:

A 24/7 (“twenty-four seven”) business is one that operates 24 hours a day seven days a week.

10m is 10 million

10bn is 10 billion (a billion = thousand million)

1 ½ hours is one and a half hours or an hour and a half (or ninety minutes)

The period from January to June is six months (not half a year).

II. Write the following in words rather than in figures.

- a) 2% of the British population owned 90% of the country’s wealth in 2006.
- b) $0^{\circ} \text{C} = 32^{\circ} \text{F}$
- c) 62.3% of adults have false teeth.
- d) $\frac{2}{3} + \frac{1}{4} \times 4^2 = 14 \frac{2}{3}$
- e) 2,769,425 people live here

III. Read the following records aloud:

- a) Oxygen accounts for 46.6% of the earth’s crust.
- b) The nearest star to earth is Proxima Centauri. It is 33,923,310,000,000 km from earths.
- c) The highest waterfall in the world is Angel Falls in Venezuela with a drop of 979 km.
- d) The top coffee-drinking country in the world is Finland where 964 cups per annum are consumed per head of the population
- e) The tallest church in the world is the Chicago Methodist Temple which is 173 m or 568 ft high.
- f) The second commonest item of lost property on London transport is the mobile phone. 19,453 mobile phones were handed in to London transport lost property offices in 2015.
- g) The smallest country in the world is the Vatican City with an area of 0.4 sq km.

ADDITION AND SUBTRACTION

NUMBERS

Read the text and put the paragraphs into the right order.

A

In every number each digit has a certain *place value*, and the position of a digit in a number gives the digit its value. From right to left these values are units, tens, hundreds, thousands, ten thousands, and so on. For example, in the four-digit number 9,547, the digit 7 has a value of 7 units, the 4 is in the tens place and has a value of 4 tens (40 units), the 5 is in the hundreds place with a value of 5 hundreds (500 units), and the 9 in the thousands place has a value of 9 thousands (9,000 units)

B

Technicians and engineers are more concerned with concrete numbers. A *concrete number* is one that is connected with a particular quantity or object and therefore consists of two parts. The first part is a number which tells us *how much*; the second part specifies the unit of measurement or object and tells us *what*. For example, 60 cycles, 25 ohms, 10 microfarads, and 30 henrys are concrete number. In Chap. 11 you will study some interesting methods of dealing with concrete numbers as applied to units and dimensions relating to electricity and electronics.

C

An *abstract number* is one that has no reference to any quantity or object. For example, the number 16, when used by itself, is an abstract number. In general, you will be concerned with abstract numbers only when dealing with basic mathematical principles and procedures.

D

Our system of *numbers* is composed of the 10 digits 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0. All numbers consist of combinations of these digits. Arithmetic consists of the relations of numbers and the methods of computing with numbers.

E

In general, concrete numbers should be added only when they are related to the *same kind of units or things*. For example, it would not make sense to add 47 ohms and 2 horsepower. However, this rule cannot be followed blindly because it *would* be sensible to add 40 resistors and 35 capacitors to obtain 75 parts, or objects. Here, we would be adding parts or *things*.

ADDITION

The word "plus" indicates addition and is denoted by +. The equality sign = means "is equal to". Thus, in the language of mathematics $6 + 8 = 14$. In English this says that 6 plus 8 is equal to 14. The quantity, or number, obtained by adding two or more numbers is known as the *sum* of those numbers. Therefore, as indicated above, the sum of 6 and 8 is 14.

Read the passages below and think of the best headings.

..... (main heading)

..... (subheading 1)

A *common fraction*, as distinguished from a decimal fraction (Chap. 5), is an indicated division of two whole numbers and expresses one or more of equal parts into which a thing is divided. For example, the common fraction $5/6$ has two meanings, either that 5 is to be divided by 6 or that something has been divided into 5 or 6 equal parts.

The number *above* the line of a fraction, the dividend, is called the *numerator* of the fraction. The number *below* the line, the divisor, is called the *denominator* of the fraction. Note that the numerator states *how many* of the *equal parts* that are contained in the denominator. Thus,

$$\text{A fraction} = \frac{\text{numerator}}{\text{denominator}} = \frac{\text{how many parts}}{\text{number of equal parts}}$$

A fraction in which the numerator is less than the denominator is called a *proper fraction*. $1/3$, $5/8$, and $12/13$ are proper fractions.

An *improper fraction* is one containing a numerator equal to or greater than the denominator. $4/4$, $9/9$, $3/2$, and $9/4$ are improper fractions.

..... (subheading 2)

When working with fractions, it is necessary to make frequent use of the following important principles.

- 1) The numerator and the denominator of a fraction can be multiplied by the same number, except zero, without changing the value of the fraction.
- 2) The numerator and the denominator of a fraction can be divided by the same number, except zero, without changing the value of the fraction.

Example 1 $\frac{4}{5} = \frac{4 \times 3}{5 \times 3} = \frac{12}{15} = \frac{4}{5}$

Example 2 $\frac{12}{15} = \frac{12 : 3}{15 : 3} = \frac{4}{5} = \frac{12}{15}$

It will be noted that no new principles are involved in performing these operations, because multiplying or dividing both numerator and denominator by the same number, except zero, is the same as multiplying or dividing the fraction by 1.

PART 2

HOW TO READ THE MAIN MATHEMATICAL SYMBOLS AND SIGNS

In English, like in Czech, there is not one generally accepted “correct” way of reading mathematical symbols and expressions. The most common uses are given below. However, mathematicians usually prefer the shortest version if the context is clear.

symbol	English	Czech
+	plus	plus
-	minus	mínus
\pm	plus / minus	plus/mínus
=	equals / is equal to	rovná se / je roven
\neq	does not equal / is not equal to	nerovná se / není roven
\approx	is approximately equal to	přibližně se rovná
\equiv	is equivalent / is identically equal	je ekvivalentní
>	greater / bigger / larger than	větší než
<	less / smaller than	menší než
\nlessgtr	not greater than	není větší než
\geq	greater than or equal to	větší nebo roven než
()	(round) brackets / parentheses (<i>pl.</i>)	kulaté závorky
[]	(square) brackets	hranaté závorky
{ }	braces / curly brackets	složené závorky
(...	open bracket / brackets opened	začátek závorky
...)	close bracket / brackets closed	konec závorky
(a + b)	open bracket a plus b close bracket / a plus b all in brackets	začátek závorky a plus b konec závorky / a plus b to vše v závorce
a · x	a times x / a multiplied by x	a krát x / a násobeno x
ax	ax	ax
a : x	a divided by x	a děleno x
a/x	a over x	a lomeno x
a : b (<i>ratio</i>)	a to b	a ku b
a : b = x : y	a is to be as x is to y	a se má ku b jako x se má ku y
∞	infinity	nekonečno
ã	a tilde	a s vlnovkou
a*	a star	a s hvězdičkou
\bar{a}	a bar	a s pruhem
$\bar{\bar{a}}$	a double bar	a se dvěma pruhy
a´	a dash	a s čárkou
a _n	a sub n / a n / a subscript n	a s indexem n / a n
a ₁	a sub 1	a jedna
a	absolute value of a	absolutní hodnota z a
n!	n factorial	n faktoriál
→	tends to	blíží se
⇒	implies	implikuje
A	capital A	velké a

Greek alphabet

Česky/Czech	Anglicky/English	Výslovnost/Pronunciation
α (alfa)	alpha	'ælfə
β (beta)	beta	'bi:tə
γ, Γ (gama)	gamma	'gæmə
δ, Δ (delta)	delta	'deltə
ε, ϵ (epsilon)	epsilon	'epsɪlɒn, ep'saɪlɒn
ζ ((d)zéta)	zeta	'zi:tə
η (éta)	eta	'i:tə
$\theta, \vartheta, \Theta$ (theta)	theta	'θi:tə
ι (iota)	iota	aɪ'əʊtə
κ, κ (kappa)	kappa	'kæpə
λ, Λ (lambda)	lambda	'læmdə
μ (mí)	mu	'mju:
ν (ný)	nu	'nju:
ξ, Ξ (ksí)	xi	sɑɪ, zɑɪ, ksɑɪ, gzɑɪ
\omicron (omikron)	omicron	əʊ'maɪkrɒn
π, Π (pí)	pi	pɑɪ
ρ, ϱ (ró)	rho	rəʊ
σ, Σ (sigma)	sigma	'sɪgmə
τ (tau)	tau	tɔ:, tɑʊ
υ (ypsilon)	upsilon	ʌp'saɪlɒn, 'ʊpsɪlɒn
φ, ϕ, Φ (fí)	phi	fɑɪ
χ (chí)	chi	kɑɪ
ψ, Ψ (psí)	psi	psɑɪ, sɑɪ
ω, Ω (omega)	omega	'əʊmɪgə

MATHEMATICAL OPERATIONS

English	Czech	examples	
addition	sčítání	$5 + 7 = 12$	five plus seven equals/is/makes/are/is equal to twelve
to add	sčítat	$a + b = c$	a plus b equals c
subtraction	odečítání	$9 - 3 = 6$	nine minus three equals six
to subtract	odečítat	$a - b = c$	a minus be equals c
multiplication	násobení	$1x$	once
to multiply	násobit	$2x$	twice
		$3x$	three times (etc.)
		$5 \times 3 = 15$	five time three is fifteen
		$ab = c$	a (times) b equals c
division	dělení	$6 : 2 = 3$	six divided by two is three
to divide	dělit	$a : b = c$	a divided by b equals c
raising to the power	mocnění	5^2	five squared
to raise to the power of	umocnit na	a^3	a cubed
power	mocnina	a^{-3}	a to the minus three
exponent	exponent/ mocnina	$(a + b)^2$	a plus be all squared
superscript	horní index	$x^2 + y^2$	x squared plus y squared
subscript	index	$(a + b)^3$	a plus b all cubed
		Pattern for reading higher powers: to + definite article + ordinal number:	
		a^4	a to the fourth
		a^n	a to the nth
		a^{n+1}	a to the n plus one
		$(a^m)^n$	a to the mth all to the nth
		$1 + x^5$	one plus x to the fifth
		$(a + b)^{-1}$	a plus b all to the minus one
		a^{-1}	a to the minus one
		a^{-n}	a to the minus n
		$a^{1/3}$	a to the one third
		$a^{-1/3}$	a to the minus one third
		$a^{1/x}$	a to the one over x
		$a^{2/3}$	a to the two thirds

English	Czech	examples	
extraction of the root/ finding the root	odmocňování	\sqrt{a} $\sqrt[3]{a}$	the square root of a the cube root of a / a to the one third
to find the root	odmocnit		
index, indices (pl.)	odmocnitel		
root	kořen		
		Pattern for reading next roots: definite article + ordinal number + root of	
		$\sqrt[4]{a}$ $\sqrt[n]{a}$ $\sqrt[x]{a}$ $\sqrt[-3]{a}$	the fourth root of a the nth root of a / a to the one over n the xth root of a / a to the one over x The minus cube root of a / a to the minus one third

fractions	zlomky	1/2	a half / one half
vulgar fractions	obecné zlomky	1/3	one third
numerator	čitatel	1/4	one quarter / one fourth
denominator	jmenovatel		
fraction line	zlomková čára		
		Pattern for reading other fraction: numerator: basic number; denominator: ordinal number in plural (unless there is 1 at the end)	
		3/2	three halves
		2/5	two fifths
		4/10	four tenths
		a/b	a over b
		5/21	five over twenty-one

decimal fractions	desetinný zlomek	.1 / 0.1	point one / nought point one
decimal / decimal number	desetinné číslo	.01	point nought one
decimal point	desetinná tečka	.001	point double nought one
nought (BE), oh, zero (AE)	0 (nula)	.321	point three two one
		2.1	two point one
		12.5	twelve point five

(MATHEMATICAL) ANALYSIS

English	Czech	examples
function	funkce	$f(x); F(x)$, etc. fx / function x / function of x $y = f(x)$ y is equal to the function (of) x / y is equal to f of x

differentiation	derivování	
to differentiate	derivovat	
to derive	odvozovat	
derivative	derivace	
differential	diferenciál	dy differential y
variation	variace	∂y a variation in y
increment	přírůstek	Δy an increment of y
examples		
$\frac{dy}{dx}; \frac{df(x)}{dx}; y'; f'(x); D_x y$		the (first) derivative of y with respect to x, where $y = f(x)$ první derivace y podle x, kde $y = f(x)$
$f'(x_0)$		the (first) derivative of f at x_0 první derivace f(x) podle x v bodě x_0
$\frac{d^n y}{dx^n}; y^{(n)}; f^{(n)}(x); D_x^n y$		the nth derivative of $y = f(x)$ with respect to x / d to the nth y by dx to the nth (e. g. $\frac{d^2 y}{dx^2}$: d squared y by dx squared) n-tá derivace y podle x
$\frac{\partial u}{\partial x}; u_x; \partial_x u; f_x(x, y); D_x(u); f'_x(x, y)$		partial du by partial dx / the partial derivative of $u = f(x, y)$ with respect to x parciální derivace u dle x
$\frac{\partial f}{\partial x}(x_0, y_0)$		the first partial derivative of $f(x, y)$ with respect to x at (x_0, y_0) první parciální derivace f(x, y) podle x v bodě (x_0, y_0)
$\frac{\partial^2 u}{\partial x \partial y}; u_{xy}; \partial_{xy}^2 u; f_{xy}(x, y); D_y(D_x u)$		the second partial derivative of $u = f(x, y)$, taken first with respect to x and then with respect to y / partial d squared u by partial dy dx druhá parciální derivace $u = f(x, y)$ podle x a y

English	Czech	examples	
integration	integrování	\int_a^b	the integral of... from a to b
to integrate	integrovat		
integral	integrál	\iint	double integral
		$\int f(x) dx$	the integral of $f(x)$ with respect to x
		$\int_a^b f(x) dx$	The (definite) integral of $f(x)$ from a to b

limits	limity	lim	limit
		\rightarrow	tends to, approaches to (jde/blíží se k)
		$\lim_{x \rightarrow a} f(x) = b$	The limit of $f(x)$ where x tends to a is equal to b
		$\lim_{x \rightarrow a} [f(x) + g(x)] = s + t$ The limit of $f(x)$ plus $g(x)$ as x tends to a is equal to s plus t	

English	Czech
trigonometry	trigonometrie
$\sin x$ ['saɪn 'eks]	$\sin x$
$\cos x$ ['kɒs 'eks] / cosine x	$\cos x$
$\tan x$ ['tæn 'eks] / tangent x ['tændʒənt]	$\operatorname{tg} x$
$\cot x$; $\operatorname{ctn} x$ ['kɒt 'eks] / cotangent x [kəʊ'tændʒənt 'eks]	$\operatorname{ctg} x$
$\sec x$ / secant x ['si:kənt 'eks]	$\sec x$
$\csc x$; cosec x , cosecant x [,kəʊ'si:kənt 'eks]	$\operatorname{cosec} x$

GENERAL MATHEMATICAL VOCABULARY

above	výše uvedený, výše
according to	podle
accordingly	podobně, podle toho
algebraic	algebraický
to apply	použít, aplikovat
as	jako, stejně jako
to be true	platit (mat.)
to be valid	platit (mat.)
calculus	počet
change	změna
change of state	změna stavu
consideration	úvaha, zřetel
constant	konstanta
definition	definice
to denote	označit
dependent	závislý
differential calculus	diferenciální počet
equation	rovnice
to evaluate	vypočítat
expression	výraz
to follow	plynout /z), následovat (za), sledovat
for	neboť
to generalize	zevšeobecnit
hence	odtud plyne, z čehož plyne
to hold, held, held	ponechávat, držet, platit (o zákonu)
to imply	zahrnovat, implikovat, plynout (z)
in the form	ve tvaru
independent (of)	nezávislý
independent variable	nezávislá proměnná
lemma	lemma/poučka/pomocná věta
let	necht', budiž
merely	pouze
partial	parciální
partial derivative	parciální derivace
proof	důkaz
property	vlastnost
quantity	množství, veličina
relation (between)	vztah (mezi)
relationship	vztah
representation	vyjádření
respect	ohled
similarly	podobně, obdobně
state	stav
theorem	poučka, teorém

thus	tak, z toho, tedy
true	pravdivý, věrný, pravý
under consideration	uvažovaný
valid (for)	platný (pro)
value	hodnota
variable (<i>noun</i>)	proměnná
where	kde
whereas	kdežto
with respect to	dle (mat.)
thence	odtamtud plyne, tudíž
whence	odkud plyne, tudíž

EXERCISES – VOCABULARY

I. Read the following numbers:

25; 19; 9; 2,279; 103; 1,000,000; 14; 40; 104; 138; 500; 44,005; 2,004; 836; 1,017; 6,000; 82,985; 10,000,000; 200,000; 15; 50; 629; 2,102; 12; 17; 70; 708; 7,008; 1,825; 1,901; 348; 990; 3,000; 8,000,000; 1,621; 3,508; 3,528; 3,500; 180; 18; 6,213; 963; 2,000,000,000; 1,526

II. Read:

a) $2 + 5 =$; $10 + 8 =$; $25 + 15 =$; $78 + 7 =$; $49 + 9 =$; $99 + 1 =$; $129 + 37 =$;
 $371 + 371 =$; $a + b$; $-x + 1$; $x + y$; $1 + y$

b) $19 - 7 =$; $23 - 9 =$; $91 - 18 =$; $11 - 3 =$; $20 - 10 =$; $150 - 100 =$; $1050 - 85 =$;
 $5,000 - 3,000 =$; $a - x$; $x - 1$; $a - b$

c) $5.5 =$; $3.8 =$; $7.7 =$; $4.12 =$; $13.10 =$; $6.9 =$; $ab = 0$; $xy = z$; $2ab$

d) $9 : 3 =$; $5 : 1 =$; $21 : 7 =$; $27 : 9 =$; $35 : 5 =$; $100 : 10 =$; $48 : 12 =$; $75 : 15 =$;
 $a : b = x$; $X : Z = y$

e) $\frac{2}{3}$; $\frac{4}{7}$; $\frac{1}{2}$; $\frac{3}{4}$; $\frac{1}{10}$; $\frac{5}{100}$; $\frac{3}{1000}$; $\frac{6}{21}$; $\frac{4}{3}$; $\frac{5}{2}$; $\frac{a}{b}$; $\frac{b^2}{c}$; $\frac{\alpha}{y}$; $\frac{\pi}{2}$; $\frac{1}{x}$; $\frac{x}{2}$; $\frac{1}{\sqrt{x}}$; $\frac{c+d}{c-d}$

f) 0.1; .1; .002; 0.003; .2334; 5.1; 7.99; 10.5; 100.25

g) 2^2 ; 2^3 ; a^2 ; a^{-2} ; a^3 ; a^{-3} ; $(x^2 + y^2) = z$; $a^2 + b^2$; $(a + b)^3$; $(a + b)^m$; $a^n a^m$;
 $a^m \cdot a^n = a^{m+n}$; $\frac{1}{a^n} = a^{-n}$; $\frac{a^m}{a^n} = a^{m-n}$; $(a^m)^n = a^{mn}$; $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$; $(a + b)^{-1}$;
 x^{-1} ; $a^{1/3}$; $a^{-1/3}$; a^x ; $a^{1/x}$; $a^{-1/x}$; $(a^{2/3})^x$

h) \sqrt{x} ; $\sqrt[3]{a}$; $\sqrt[4]{x+1}$; $\sqrt[n]{y}$; $\sqrt[2]{a}$; $\sqrt[3]{x}$; $\sqrt[n]{a^n} \cdot a$; $\sqrt[n]{a} = a^{1/n}$; $\sqrt[m]{a^n} = (\sqrt[m]{a})^n = a^{n/m}$; $\sqrt[n]{\frac{1}{a}} = \frac{1}{\sqrt[n]{a}} = a^{1/n}$; $\sqrt[n]{ab} = \sqrt[n]{a} \cdot \sqrt[n]{b}$; $a\sqrt[n]{b} = \sqrt[n]{a^n b}$; $\sqrt[n]{0} = 0$

III. Read the following signs:

0; +; -; ±; a · b; a : b; x : y = a : b; =; ≡; ≠; ≈; ≐; a > b; b < a; a ≠ b;
 y ≠ x; (); []; ã; a*; ā; ā; a**; a'; a''; a_n; x₁; y₂; |a|; n!; →; ⇒; X; a;
 \int ; \iint ; ∞

IV. Read the following letters of Greek alphabet, giving their Czech names:

α; β; γ; σ; ω; Δ; δ; θ; λ; φ; μ; ν; ρ; η; ε; τ; χ; ψ; κ; ζ; ξ; υ; ο; Σ; Π; Ω

V. Read the words and pay attention to their stress - if necessary, use a dictionary.

- different, difference, differentiate, differential, differentiation
- add, addition additional, additionally
- subtract, subtraction
- multiply, multiplication, multiple
- divide, division
- integrate, integration, integral
- derive, derivation, derivative

VI. Say in Czech.

- equation, expression, formula, theorem, proof, quantity, constant, variable, value, property, relation
- accordingly, hence, thence, whence
- let us assume that...; let a – b; let P denote...; let Equation 1 denote...; according to Eq. 2; let a = b
- the equation is valid for...; (b) is true, if...; Eq. 5 holds for...; the relation applies for all values of...
- Eq. 1 may be expressed as...; we can express Eq. 1 as ...; Eq. 3 may be written in the form...; P can be written as...; the following equation may be put as...

VII. Say in English.

a) rovnice, sčítání, odčítání, násobení, dělení, výsledek, mocnění, mocnina, index, odmocňování, lomeno, funkce, matematická analýza, derivování, derivovat, odvodit, diferenciál, integrál, integrování, sčítat, odčítat, násobeno 5, děleno 5, umocnit na druhou, umocnit na třetí, integrovat, odmocňovat

b)

druhá mocnina	třetí mocnina	kořen	desetinné číslo
zlomek	v čitateli	ve jmenovateli	desetinná tečka
matematická analýza	součet	součin	n-tá odmocnina z
zlomková čára	rozlišit	derivovat	odvodit
krátit zlomek	tudíž	rovnice platí	předpokládejme, že
necht' $a = 1$	konečné číslo	celé číslo	nekonečno
50 %	řadová číslovka	a se blíží 0	na obr. 3
zaokrouhlit	x je rovno	lichý	důkaz
rozdíl	sudý	druhá derivace	označme

VIII. Fill in the missing words – each word can be used only once.

Sum, number, calculus, infinite, technique, branch, theorems, differential, limit, concept, applying, subdivision, variable, zero, operations, differentiation

The branch of mathematics referred to as calculus (or the) is customarily divided into two main parts, i.e. and integral calculus, although the techniques of calculus also involve work with sequences and series. In fact, calculus is merely a part of a larger of mathematics that uses the same This of mathematics is usually called analysis. The major of calculus and the techniques for its operations to problem solving are based on the concept of The limit is basic to the development of the two main of the calculus that are not found in more elementary mathematics, namely differentiation and In general, is used to determine the instantaneous rate of change in one with respect to another; that is, the limit of the rate of change as the time of the change approaches Similarly, integration is used to obtain an exact sum of an infinite of parts; that is, the limit of the as the number of parts increases without bound.

DIFFERENTIALS

For a system having one independent property which we shall denote by x , let P denote a dependent property,

$$P = P(x) ,$$

and ΔP denote the change of P in a change of state from a state 0. According to Taylor's theorem, we may express ΔP in the form

$$\Delta P = \frac{1}{1!} \left(\frac{dP}{dx} \right) \Delta x + \frac{1}{2!} \left(\frac{d^2P}{dx^2} \right) \Delta x^2 + \quad (1)$$

Where $\left(\frac{dP}{dx} \right)$, $\left(\frac{d^2P}{dx^2} \right)$, ... are the derivatives of P with respect to x evaluated at state 0, and Δx the change of x in the change of state under consideration.

Equation (1) may be written in the form

$$\Delta P = \left(\frac{dP}{dx} \right) \Delta x + R \quad , \quad (2)$$

Where R is a quantity for which

$$\lim_{\Delta x \rightarrow 0} \left(\frac{R}{\Delta x} \right) = 0 \quad . \quad (3)$$

As in the differential calculus, we shall denote the quantity $\left(\frac{dP}{dx} \right) \Delta x$ by dP and we will call it the differential of P . Thus

$$dP \equiv \left(\frac{dP}{dx} \right) \Delta x \quad . \quad (4)$$

This expression defines the differential of a dependent property. Differentials may be used in algebraic relations only if the relation applies for all values of Δx . For example the relation

$$dP = 0$$

implies

$$\left(\frac{dP}{dx} \right) = 0 \quad .$$

Similarly, the relationship

$$dN = dM$$

Between the differentials of dependent properties N and M implies

$$\left(\frac{dN}{dx}\right) = \left(\frac{dM}{dx}\right),$$

Whereas the relationship

$$dN = (dM)^2 \tag{a}$$

Implies

$$\left(\frac{dN}{dx}\right) = 0 = \left(\frac{dM}{dx}\right). \tag{b}$$

For, (a) can be written as

$$\left(\frac{dN}{dx}\right) \Delta x = \left(\frac{dM}{dx}\right)^2 (\Delta x)^2$$

Which is valid for all values of Δx only if (b) is true. It follows that a relationship between differentials of dependent properties is merely a representation of a relationship between derivatives.

The change Δx of the independent variable x during any change of state is also called the differential of x and it is denoted by dx . Hence

$$dx \equiv \Delta x. \tag{5}$$

Accordingly, we may write for the differential dP of P

$$dP = \left(\frac{dP}{dx}\right) \Delta x = \left(\frac{dP}{dx}\right) dx.$$

The above definitions can be generalized to systems of many independent variable. Accordingly, the differential dP of a property of a system having independent properties x_1, x_2, \dots, x_n is defined by the relationship

$$dP \equiv \left(\frac{\partial P}{\partial x_1}\right) dx_1 + \left(\frac{\partial P}{\partial x_2}\right) dx_2 - \dots + \left(\frac{\partial P}{\partial x_n}\right)_{x_i} dx_n \tag{6}$$

where

$$dx_1 \equiv \Delta x_1, dx_2 \equiv \Delta x_2, \dots, dx_n \equiv \Delta x_n,$$

and $(\partial P / \partial x_k)_{x_i}$ is the partial derivative of P with respect to x_k , holding all other independent properties x_i ($i \neq k$) constant.

1. Case Study: Newton's Law of Cooling

When a hot liquid is placed in a cooler environment, _____ observation shows that its temperature decreases to _____ that of its surroundings. A typical graph of the temperature of the liquid _____ against time is shown in Figure 1.

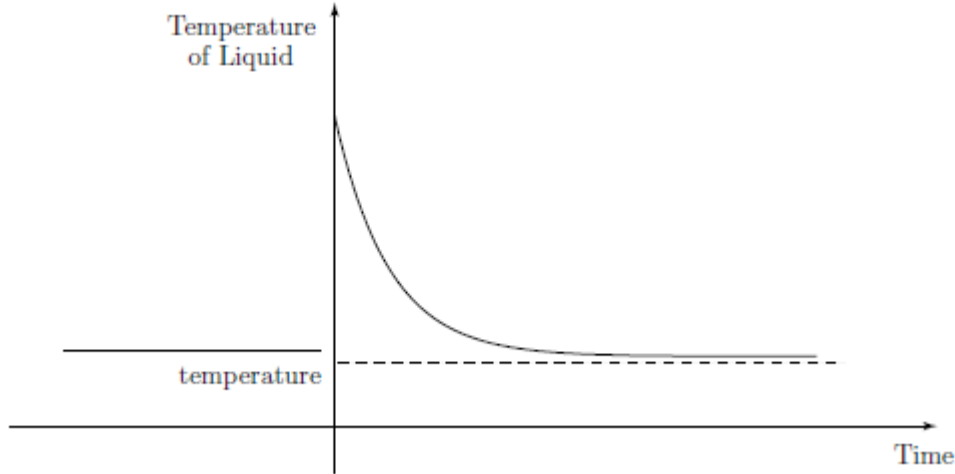


Figure 1

After an _____ rapid _____ the temperature changes progressively _____ rapidly and _____ the curve appears to 'flatten out'.

Newton's law of cooling states that the rate of cooling of liquid is _____ to the difference between its temperature and the temperature of its _____.

To _____ this into mathematics, let t be the time _____ (in seconds, s), θ the temperature of the liquid ($^{\circ}\text{C}$), and θ_0 the temperature of the liquid at the start ($t=0$). The temperature of the _____ is _____ by θ_s .

Try each part of this exercise

Write down the mathematical _____ which is _____ to Newton's law and state the accompanying condition.

Part (a) First, find expressions for the _____ of cooling and the difference between the liquid's temperature and that of the environment.

Part (b) Now formulate Newton's law of cooling.

In the _____ example we call t the _____ variable and θ the _____ variable. Since the condition is given at $t=0$ we refer to it as an _____ condition. For reference, the solution of the differential equation which _____ the initial condition is $\theta = \theta_s + (\theta_0 - \theta_s)e^{-kt}$.

Fill in the missing words:

surroundings	eventually	convert	experimental	plotted
satisfies	independent	initial	initially	above
denoted	rate	equivalent	environment	
surrounding	less	approximately	decrease	
proportional	elapsed	dependent	equation	

2. The General Solution of a Differential Equation

Consider the formula $y = Ae^{2x}$ where A is an arbitrary constant. If we differentiate it we obtain

$$\frac{dy}{dx} = 2Ae^{2x}$$

and so, since $y = Ae^{2x}$ we obtain

$$\frac{dy}{dx} = 2y.$$

Then the differential equation satisfied by y is

$$\frac{dy}{dx} = 2y.$$

Notice that we have eliminated the arbitrary constant.

Now consider the formula

$$y = A \cos 3x + B \sin 3x$$

where A and B are arbitrary constants. Differentiating, we obtain

$$\frac{dy}{dx} = -3A \sin 3x + 3B \cos 3x.$$

Differentiating a second time gives

$$\frac{d^2y}{dx^2} = -9A \cos 3x - 9B \sin 3x.$$

The right-hand side is simply (-9) times the expression for y . Hence y satisfies the differential equation

$$\frac{d^2y}{dx^2} = -9y.$$

Now do this exercise

Find a differential equation satisfied by $y = A \cosh 2x + B \sinh 2x$ where A and B are arbitrary constants.

Answer

We have seen that an expression including one arbitrary constant required one differentiation to obtain a differential equation which eliminated the arbitrary constant. Where two constants were present, two differentiations were required. Is the converse true? For example, would a differential equation involving

$\frac{dy}{dx}$ as the only derivative have a general solution with one arbitrary constant and would a differential equation which had $\frac{d^2y}{dx^2}$ as the highest derivative produce a general solution with two arbitrary constants?

The answer is, usually, yes.

Source: http://www3.ul.ie/~mlc/support/Loughborough%20website/chap19/19_1.pdf

Compare the meanings of the following words

NUMBER

= a word or sign that is used to talk about an exact quantity or to show the position of something in a series or in an ordered set or list.

Each player has a number on the back of their shirt.

Raffle ticket number 241 wins the dinner for two at La Fiorentina.

What's your phone number?

A number 22 tram

in Equation 5, in Fig. 3., on page 6, at 18 High Street

FIGURE

- a) A particular number or amount expressed as an official number or a statistic that has been counted or calculated, **often used in plural**:

Recent government figures show that there are 127,000 families with four or more children.

Employment figures for October.

- b) Any of the ten written symbols from 0 to 9 that are used to represent a number (i. e. a number written as a sign, not as a word):

He wrote the date in figures at the top of the page.

3,210 is a four-figure number.

Executives with salaries in six figures.

- c) A drawing or diagram that is used to explain or illustrate information that is being given; often used with a number to refer to a drawing or diagram:

This led to the development of a new type of machine (see Figure 6).

- d) In geometry, a figure is a shape, especially a regular shape:

A hexagon is a six-sided figure.

DIGIT

= a written symbol for any single number between 0 to 9 used especially in formal or technical contexts:

Move the decimal point one digit to the left.

French telephone numbers have six digits.

To unlock the door you must type in the five-digit security code.

NUMERAL

= a symbol / sign used to represent a number in a particular number system, especially a system that is no longer generally used:

In Arabic numerals, the year is written 1983, but in Roman numerals it is written MCMLXXXIII.

COUNT

- a) to say all the number one after another up to a particular number:
He began to count aloud on his fingers.
She went into the lounge and counted to twenty.
- b) to add up or check (each unit in a collection) in order to find out the sum:
Hana counted up her years of learning English.
Authorities counted 226 traffic accidents over the holiday weekend.

CALCULATE

- = to work out a number or amount from the information you have, usually by doing some arithmetic:
The percentage of nitrogen in air will then be calculated.
I'm trying to calculate how much paint we need.

COMPUTE

- = to calculate (an answer, result, value, etc.) especially with the aid of a computer:
The machine can be used both for serious computing and playing computer games.
Explanation of how the numbers have been computed are given in the notes following the table.

EXERCISES – VOCABULARY

I. In the following sentences fill in the word (number, figure, digit, or numeral) that fits the context.

1. The _____ 1977 contains four _____.
2. Let X be a _____ from 1 to 10.
3. This machine is able to print _____ as well as letters.
4. The _____ of chairs in this room is ten.
5. The members of the club are four hundred in _____.
6. The page _____ are in the right-hand corners of the book.
7. Write the _____ in words and in _____.
8. The _____ for "one" is "1".
9. The _____ 18 and 81 are different, but contain the same _____.

II. Fill in the right verbs (count, calculate, compute) in the sentences below.

1. We can now _____ the area of this triangle.
2. The driver _____ the passengers and found that one person was missing.
3. Mary is only four and she can _____ up to twenty.
4. He paused and _____ for a moment how long it would take him.
5. I _____ the people in the queue and decided not to wait.
6. We must check these figures before we try to _____ the loss.
7. Can you _____ the distance of the Moon from the Earth?

UNIT 4

PRESENTATION

Giving a presentation in a seminar may involve presenting factual and numerical information, as well as different perspectives on an issue. Often the perspectives you choose will influence the way your presentation is organized. When a presentation includes numbers, it is important to be able to say these clearly and correctly. When giving each other feedback on presentation, try to be as constructive as possible and make specific suggestions for improvement.

I. Taking notes on the main points of a presentation

Watch a short presentation on urbanization – the growth of towns and cities and the movement of people from rural to urban areas. Note down key information on the following points:

- 1) Urbanization since 1900
- 2) Urbanization in the newly industrialized countries
- 3) The economic impacts of urbanization
- 4) The environmental impact of urbanization

II. Academic language - numbers

Focus on the way large numbers, percentages, fractions and decimals are talked about.

ACADEMIC LANGUAGE
Large numbers, percentages, fractions, decimals
When presenting numerical information, large numbers are often expressed as decimals, and are usually rounded up or down. <i>... greater Tokyo is currently around thirty-five point six (35.6) million... (compare: 35,682,460 thirty-five million, six hundred and eighty-two thousand)</i> <i>... in 1900 it stood at just two hundred and twenty (220) million...</i> <i>... this figure is likely to rise to four point nine (4.9) billion...</i>
When talking about large numbers, it is usual to use approximation. <i>... almost half the world's population living in major town and cities...</i> <i>... around 50,000 new skyscrapers will be built...</i> <i>... with just over 5 billion urban residents...</i>

III. Recognizing and using signposting language

Match the phrases from the presentation with functions 1-5.

Phrases	Functions
a) For instance	1) introducing the structure of the presentation
b) As you can see	2) introducing a new point
c) So moving on to look at	3) referring to a visual
d) Next I'd like to look at	4) moving on to a new point
e) OK, that was...	5) giving an example
f) In my presentation today I'm going to look at	
g) For example	
h) So if we look at the slide	
i) I'll then move on to look at firstly..., and secondly	

IV. Checklist for evaluating a short presentation

		Yes	No
1	Was the structure of the presentation introduced at the start?		
2	Were the main points introduced clearly?		
3	Was it clear when the speaker moved from one point to the next point?		
4	Did the speaker discuss different perspectives and give examples to support these?		
5	Were all numbers spoken clearly and correctly?		
6	Is there anything that could be improved?		

PRESENTATION - phrases

Finally I'd like to summarize
 go over the main points (of my talk)
 review
 sum up

OK then, let's begin
 can we start?
 shall we start?

Good morning/afternoon, ladies and gentleman
 everyone

I'd like to turn to
 Let's move on to my next point
 That brings me to my next point
 Now if we turn to...
 Now I'd like to draw your attention to...

Firstly	I talked about	I suggested
Secondly	discussed	drew your attention to
Then	showed you	recommended
Finally	pointed out	explained
	focused on	mentioned some of
	illustrated	

Thank you for listening

I'm here to...
 I'm going to talk to you today
 My purpose / objective / aim today is to...

First of all, I'd like to introduce myself
 My name is
 I'm from...
 I work for... (company) as a... (job)

I'd like to refer back
 go back to my (first) point
 return

In conclusion I'd like to...
 I'd like to finish /conclude by saying that

Are there any questions?
 If you have any questions, I'll be happy
 I'd be happy to answer them
 I'll do my best

(As you all know)		
Firstly		emphasize
Secondly		talk about
Thirdly	I'd like to	present
Then	I will	deal with
After that	I want to	show you
Next	I'm going to	point out
Finally		discuss
		analyse
		examine
		consider

Let's		
Have a	look at this	flow chart
I'd like you to		pie chart
As you can see from the (following)		table
		photograph
		slide

USEFUL PHRASES FOR

A. asking questions

1. I'd like to ask if/how/what/what you think about...
2. Could you please tell me/us your opinion on...
3. Can/could/will/would you give me/us more information about/on...
4. clarify how/what...
5. explain/describe your slide No. 3 in more detail?
6. You said that..... I wonder if...
7. I'd be interested in...
8. I'd like to know.... (what your results were)
9. I just want to ask....
10. I have a question: What is your opinion on...
11. I think I'd be interested in your opinion on
12. I think it would be interesting if you could
13. Let me ask you if /how/what...
14. I'm afraid I missed.... (your explanation of...)
15. I'm afraid I didn't quite catch /understand what you said about...
16. I'd like to refer to your slide No 3/showing ... Did you mean that...
17. Could you please go back to your slide No 3/showing
18. Could I just add that...
19. I'd like to say that...
20. Let me just add/point out that...

B. answering questions

1. That's a good (interesting) question.
2. If I understand correctly, you're saying that...
3. Could I just point out that...
4. I'd like to point out that...
5. In other words, ...
6. What I was trying to say was that...
7. I'd just like to remind you of...
8. To go back to your original question, ...
9. I mean that...
10. I should also add that...
11. You may be interested to know that...
12. I'd like to draw your attention to the fact that...
13. Looking at it from another point of view, ...
14. Of course (certainly), but...
15. I would agree that... Nevertheless, I would think that...
16. Not exactly...
17. In a nutshell,
18. I really don't think it's appropriate for me to comment on that.
19. I'm afraid there wasn't time enough to explain this in detail.
20. Thank you for your attention. If there are any other questions, I will be pleased to receive and answer them via e-mail.

Speaker Evaluation Form

1. Did the speaker address the audience in an appropriate way?
yes no what was wrong?
2. What was the title of his/her talk?
3. Was his/her presentation divided into: a) the introduction, b) core of presentation, c) concluding statements, d) conclusions?
yes no what was wrong/different
4. Were you able to follow the main parts of the presentation?
yes generally no
5. Did the speaker indicate moving to a new point/part?
yes no
6. Was the contribution well prepared?
yes generally no – why not
7. Would you be able to summarize the talk?
yes with difficulty no
8. Was the speaker able to hold your attention?
yes – why much of the time no – why
9. Comment on the speaker's eye contact with the audience.
good poor
10. Comment on the use of visual aids.

quantity of information

easy to read?

others
11. Was the voice loud or clear enough?
yes generally no
12. To what extent did the speaker depend on the prepared text?
totally to some degree not at all
13. Could you follow and understand the presentation even if it was not your field of interest?
yes with difficulty no – why
14. If you had other serious difficulties in following the presentation, were they caused by the speaker's
pronunciation grammar vocabulary syntax other
15. Was the speaker able to answer all the questions he was asked?
yes most of them no – why
16. What advice would you give the speaker for future presentation?