

Výukový materiál zpracovaný v rámci operačního programu Vzdělávání pro konkurenceschopnost



INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Registrační číslo: CZ.1.07/1. 5.00/34.0084

Šablona: II/2 Inovace a zkvalitnění výuky cizích jazyků na středních školách

Sada: 2 AJ

Číslo: VY_22_INOVACE_PRO_1.,2.,3.,4.,ROC_22

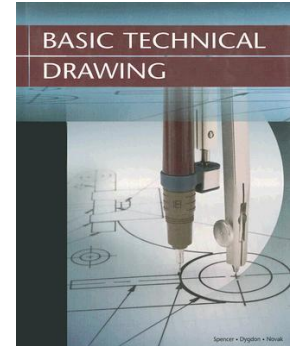
Technical English



Předmět:	Anglický jazyk
Ročník:	1.,2.,3.,4.,ročník
Klíčová slova:	engineer, CAD, drawing
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Adresa školy:	Střední škola zemědělská, Osmek 47 750 11 Přerov

Technical English

Technical Drawing

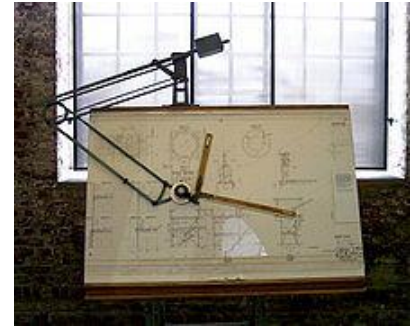


Technical drawing

- is the act and discipline of composing plans that visually communicate how something functions or is to be constructed.
- is essential for communicating ideas in industry and engineering.
- To make the drawings easier to understand, people use familiar symbols, perspectives, units of measurement, notation systems, visual styles, and page layout.
- Technical drawings are understood to have one intended meaning.

Technical English

Technical Drawing



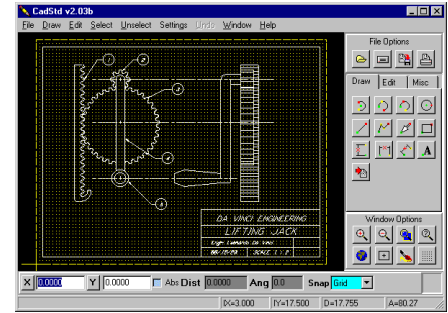
Methods

Manual or by instrument

- The basic drafting procedure is to place a piece of paper on a smooth surface with right-angle corners and straight sides—typically a drawing board.
- A sliding straightedge known as a T-square is then placed on one of the sides, allowing it to be slid across the side of the table, and over the surface of the paper.
- Modern drafting tables come equipped with a drafting machine that is supported on both sides of the table to slide over a large piece of paper.

Technical English

Technical Drawing

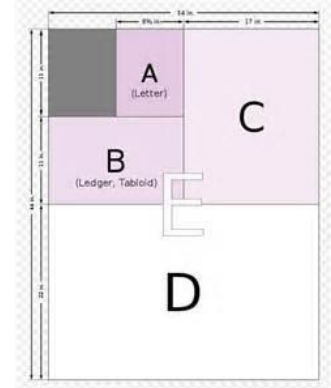


CAD (Computer aided design)

- Today, the mechanics of the drafting task have largely been automated and accelerated through the use of computer-aided drawing systems (CAD).
- There are two types of computer-aided design systems used for the production of technical drawings" two dimensions ("2D") and three dimensions ("3D").
- 2D CAD systems such as AutoCAD or MicroStation replace the paper drawing discipline. The lines, circles, arcs and curves are created within the software.

Technical English

Technical Drawing



A drafter, draftsperson, or draughtsman

- is a person who makes a drawing (technical or expressive).

Drawing material

- Drafting paper
- Thick draft paper
- Cloth
- Tracing paper
- Plastic
- Inks
- Dry transfer



ISO codeSize in millimetresSize in inchesSize in points

4A0	1582 x 2378	66.22 x 93.62	4768 x 6741
2A0	1189 x 1682	46.81 x 66.22	3370 x 4768
A0	841 x 1189	33 x 46.81	2384 x 3370
A1	594 x 841	23.39 x 33	1684 x 2384
A2	420 x 594	16.54 x 23.36	1191 x 1684
A3	297 x 420	11.69 x 16.54	842 x 1191
A4	210 x 297	8.27 x 11.69	595 x 842
A5	148 x 210	5.83 x 8.27	420 x 595
A6	105 x 148	4.13 x 5.83	298 x 420
A7	74 x 105	2.91 x 4.13	210 x 298
A8	52 x 74	2.05 x 2.91	147 x 210
A9	37 x 52	1.46 x 2.05	105 x 147
A10	26 x 37	1.02 x 1.46	74 x 105

Technical English

Technical Drawing

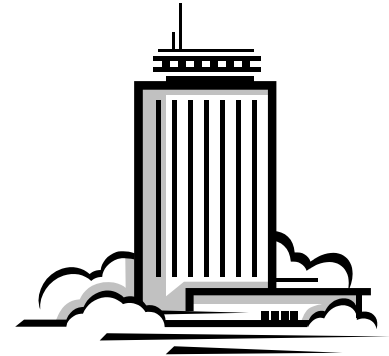
Drawing tools

- are used for measurement and layout of drawings, or to improve the consistency and speed of creation of standard drawing elements.
- Technical pen and pencils
- Drawing board
- T-square
- Drafting machine
- Rulers
- Compass
- Templates



Technical English

Technical Drawing



Applications for technical drawing

Architecture

- To communicate all aspects of the shape or design, detailed drawings are used.
- In this field, the term plan is often used when referring to the full section view of these drawings.
- Architectural drawings describe and document an architect's design.












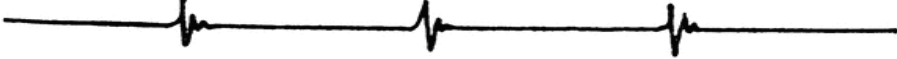



- Engineering drawings generally deal with mechanical engineered items, such as manufactured parts and equipment.
- Engineering drawings are usually created in accordance with standardized conventions for layout, nomenclature, interpretation, appearance (such as typefaces and line styles), size, etc.
- Its purpose is to accurately and unambiguously capture all the geometric features of a product or a component.
- The end goal of an engineering drawing is to convey all the required information that will allow a manufacturer to produce that component.


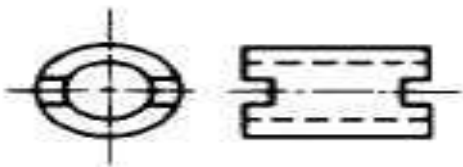

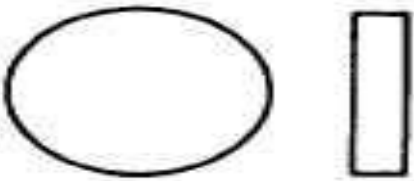

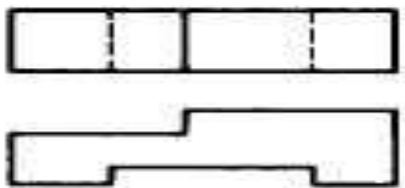

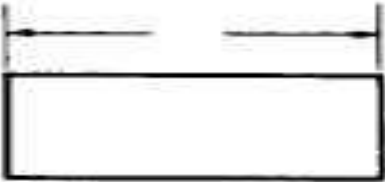

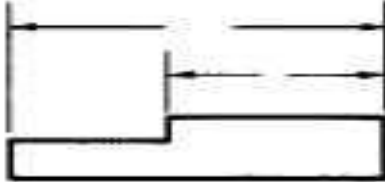
Technical English

Technical Drawing

Line Standards

- | | | |
|--|------|-------------------------|
|  | (1) | Visible outline. |
|  | (2) | Invisible outline. |
|  | (3) | Center line. |
|  | (3a) | Center line, in pencil. |
|  | (4) | Dimension line. |
|  | (5) | Extension line. |
|  | (6) | Alternate position. |
|  | (7) | Line of motion. |
|  | (8) | Cutting plane. |
|  | (9) | “Ditto” or repeat line. |
|  | (10) | Broken material. |
|  | (11) | Limiting break. |
|  | (12) | Cross-hatching line. |

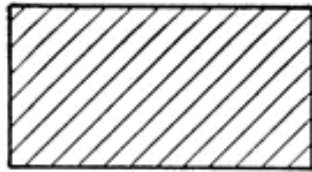
LINE STANDARDS

NAME	CONVENTION	DESCRIPTION AND APPLICATION	EXAMPLE
CENTER LINES		<p>THIN LINES MADE UP OF LONG AND SHORT DASHES ALTERNATELY SPACED AND CONSISTENT IN LENGTH</p> <p>USED TO INDICATE SYMMETRY ABOUT AN AXIS AND LOCATION OF CENTERS</p>	
VISIBLE LINES		<p>HEAVY UNBROKEN LINES</p> <p>USED TO INDICATE VISIBLE EDGES OF AN OBJECT</p>	
HIDDEN LINES		<p>MEDIUM LINES WITH SHORT EVENLY SPACED DASHES</p> <p>USED TO INDICATE CONCEALED EDGES</p>	
EXTENSION LINES		<p>THIN UNBROKEN LINES</p> <p>USED TO INDICATE EXTENT OF DIMENSIONS</p>	
DIMENSION LINES		<p>THIN LINES TERMINATED WITH ARROW HEADS AT EACH END</p> <p>USED TO INDICATE DISTANCE MEASURED</p>	

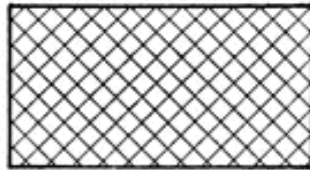
Technical English

Technical Drawing

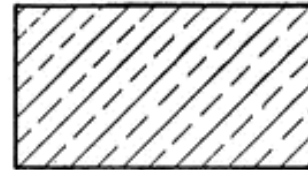
Material description



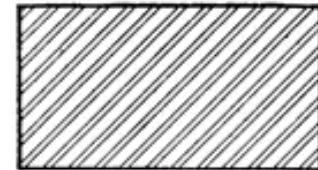
CAST IRON
(METAL IN GENERAL)



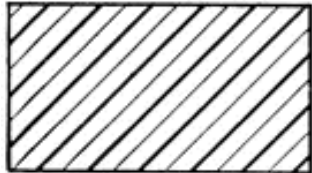
BABBITT
(LEAD, &c.)



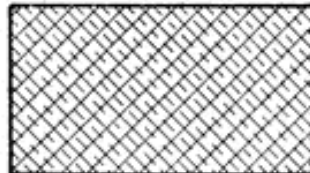
BRASS
(BRONZE OR COMPOSITION)



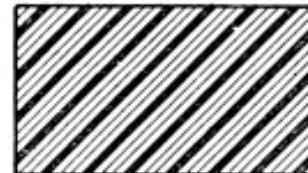
CAST STEEL



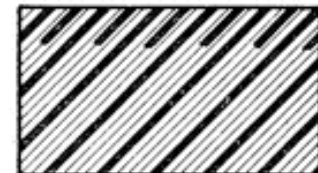
WROUGHT IRON



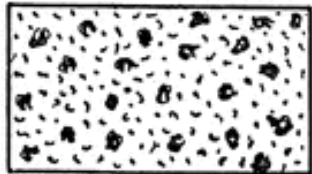
COPPER



WROUGHT STEEL



FACE HARDENED
STEEL



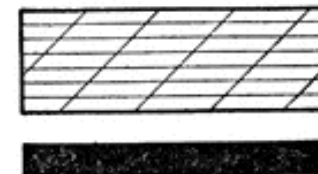
LEATHER
(OTHER FLEXIBLE MATERIALS)



GLASS



LIQUID



INSULATING
MATERIAL



Technical English

Technical Drawing



Practice 1 (true or false)

- 1) T/F Technical drawing is essential for communicating ideas in industry and engineering.
- 2) T/F Technical drawings are understood to have a lot of intended meanings.
- 3) T/F Modern drafting tables come equipped with a T-square machine that is supported on both sides of the table to slide over a large piece of paper.
- 4) T/F Engineering drawings generally deal with mechanical engineered items, such as manufactured parts and equipment.



Technical English

Technical Drawing



Practice 2 (match the numbers to the letters)

- 1) Center lines
- 2) Visible lines
- 3) Hidden lines
- 4) Extension lines
- 5) Dimension lines

- a) Used to indicate visible object.
- b) Used to indicate extent of dimensions.
- c) Used to indicate distant measures.
- d) Used to indicate symmetry about an axis and location of centers.
- e) Used to indicate concealed edges.



Technical English

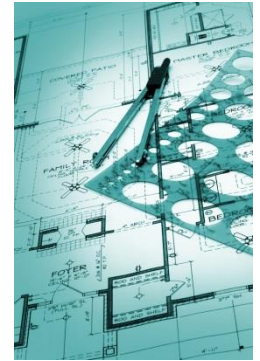
Technical Drawing



Practice 3

- 1) What is CAD?
- 2) What is 2D CAD?
- 3) What tools and material do you need for technical drawing?
- 4) What is the purpose of technical drawing?
- 5) What lines and material standards would you use to draw a technical design for a metal product in the shape of key with hooks?

Check your answers

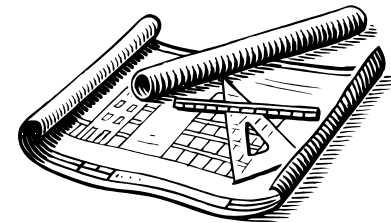


Practice 1

1T	2F	3F	4F
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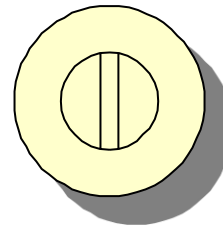
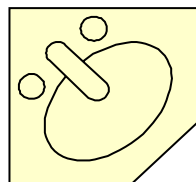
Practice 2

1D	2A	3E	4C	5B
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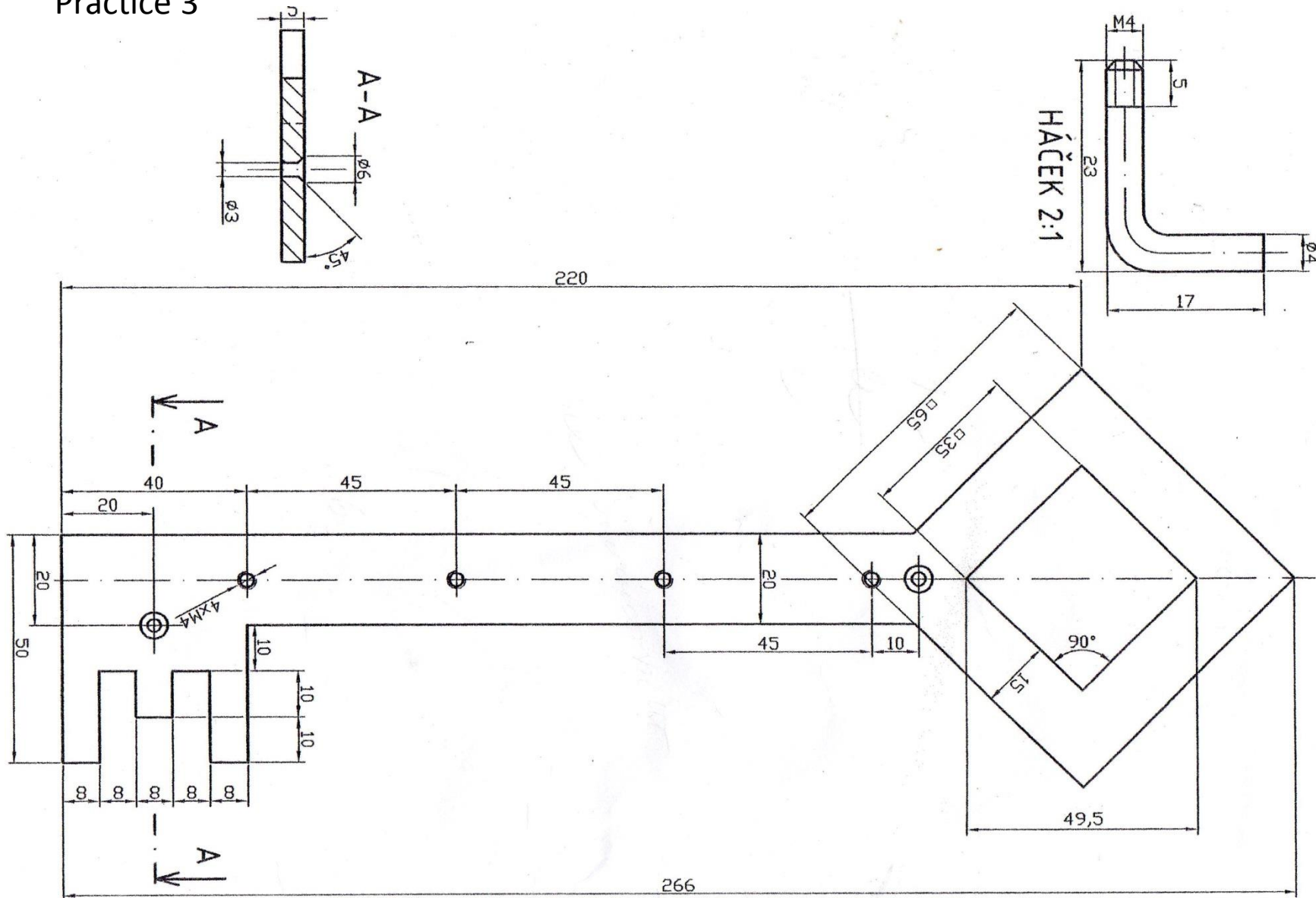


Practice 3

Slides 5-12, 17



Practice 3



Použité zdroje



- Veškeré použité obrázky (kliparty) pocházejí ze sady Microsoft Office 2010.
- Všechny fotografie pochází z archivu autora nebo Wikipedie
- O'Sullivan N., Libbin J.D., *Engineering*, Express Publishing 2011
- White L., *Engineering*, OUP 2003

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Financováno z ESF a státního rozpočtu ČR.*