

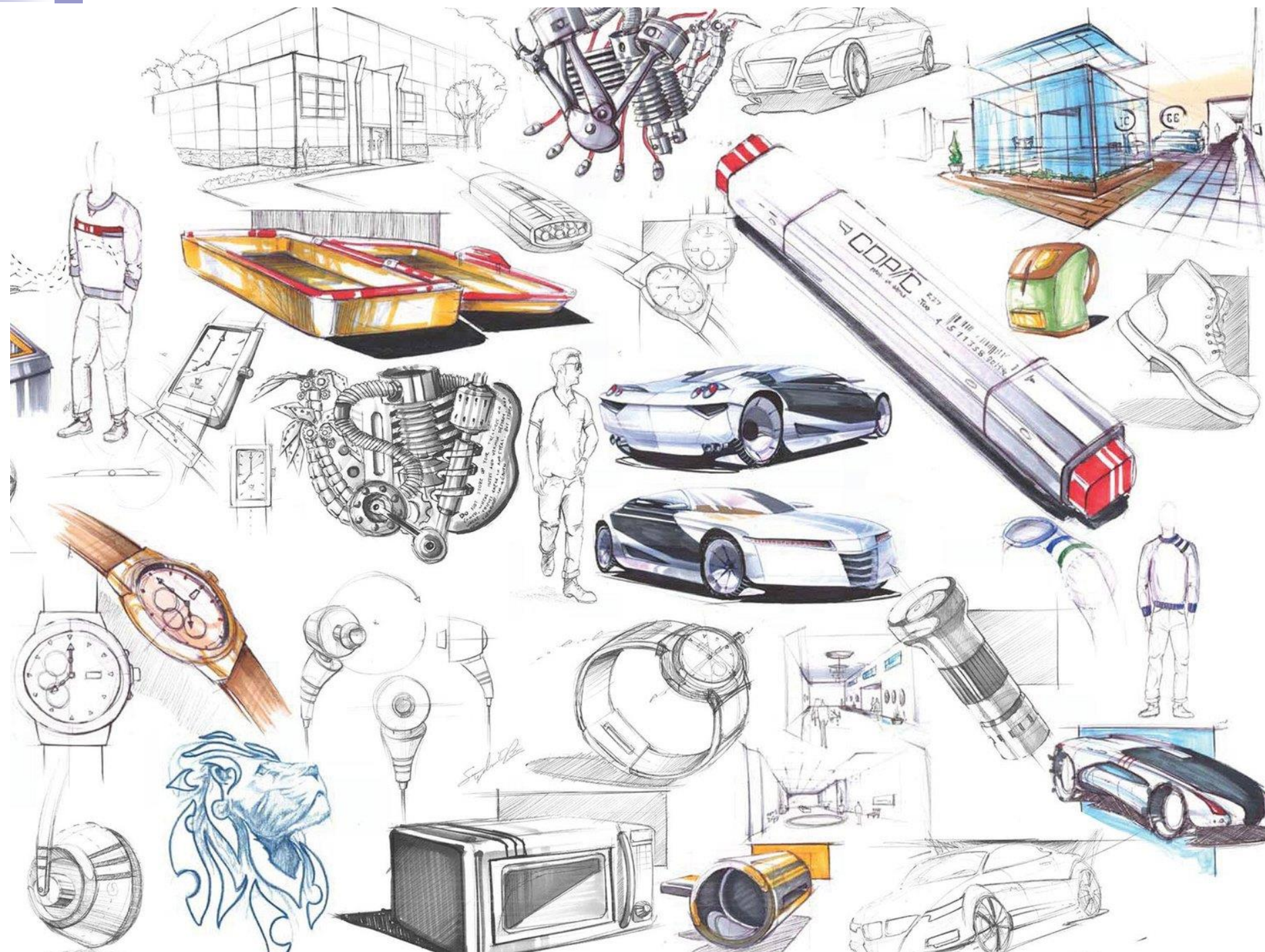
بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

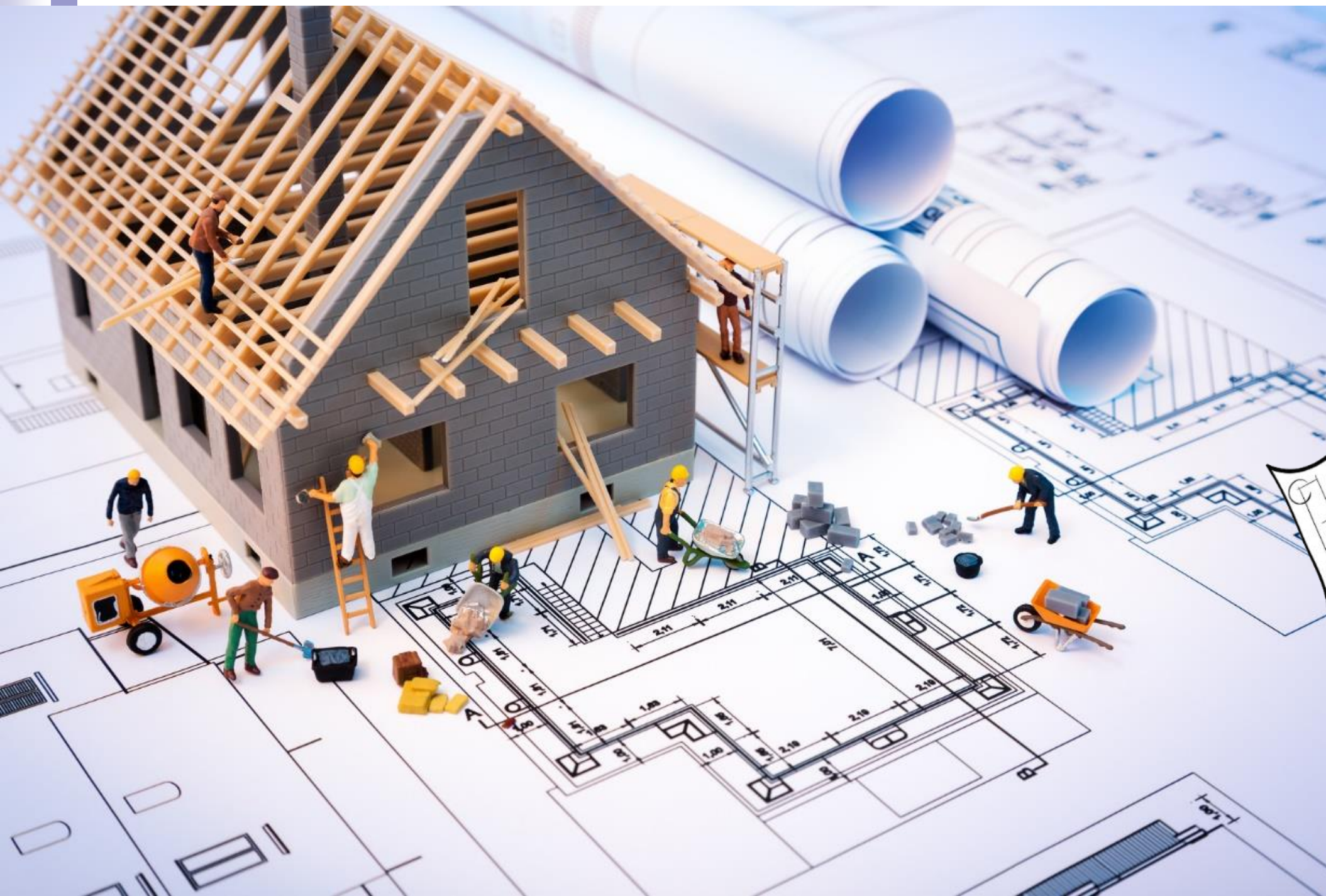


درس رسم فنی ساختمان

مدرس: مهندس محمد شاهسوندی

نیمسال اول سال تحصیلی ۱۴۰۲-۰۳
جلسه اول





نام فارسی درس: رسم فنی ساختمان		نام انگلیسی درس: Engineering drawing of buildings
تعداد واحد: ۲	نوع واحد: ۱ واحد نظری / ۱ واحد عملی	نوع درس: پایه
تعداد ساعت: ۴۸	پیشنیاز/ همنیاز: ندارد	آموزش تکمیلی: ندارد
هدف درس: آشنایی با اصول کلی رسم فنی و نقشه کشی ساختمان		
سرفصل درس:		
سرفصل نظری:		
۱. آشنایی با اصول رسم فنی و نمایش قطعات بصورت تصویری ۲. مجهول کشی در حد متعارف بدون استفاده از وسایل نقشه کشی سپس با استفاده آنها ۳. انواع پرسپکتیو (ایزومتریک- کاوالیر- دو نقطه) ۴. شناخت علائم قراردادی در نقشه‌های ساختمانی و نقشه‌های تأسیسات برقی و مکانیکی ۵. آموزش نقشه کشی - پلان‌های رایج و پلان پی، پلان تیر ریزی - نماها - برش‌ها		
سرفصل عملی		
انجام یک پروژه کامل با استفاده از نرم افزارهای رایج تجاری از قبیل AutoCad و ...		
روش ارزیابی: آزمون نهایی، آزمون نوشتاری/ آزمون عملی		
ارزشیابی مستمر	میان ترم	آزمونهای نوشتاری/ عملکردی
۲۰٪	۳۰٪	۵۰٪
پروژه		۰٪
منابع:		
۱- شهریار بهرامی (ترجمه) "نقشه کشی صنعتی" مولف N.D. Bahatt ۲- احمد متقی پور "رسم فنی عمومی" ۳- محمدرضا نمسه چی "پرسپکتیو مدرن" ۴- حسین مظفری ترشیزی (ترجمه ۱۳۸۵) "اطلاعات معماری نویقرت" ۵- مهدی قالیبافیان (چاپ نهم ۱۳۹۰) "دستور العمل طرح، محاسبه و تهیه نقشه‌های اجرایی سازه‌های ساختمانی جلد اول سازه های بتن آرمه" انتشارات دانشگاه تهران ۶- کتب و نرم افزارهای آموزش جامع اتوکد		
7- Engineering Design Graphics by James H. Earle, 2008		
8- Architects' Data by Ernest Neufert, 1970		

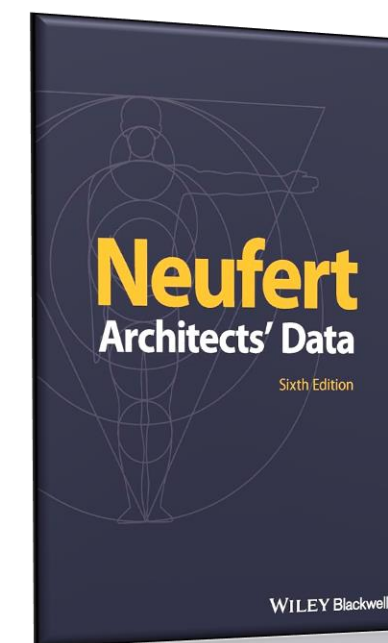
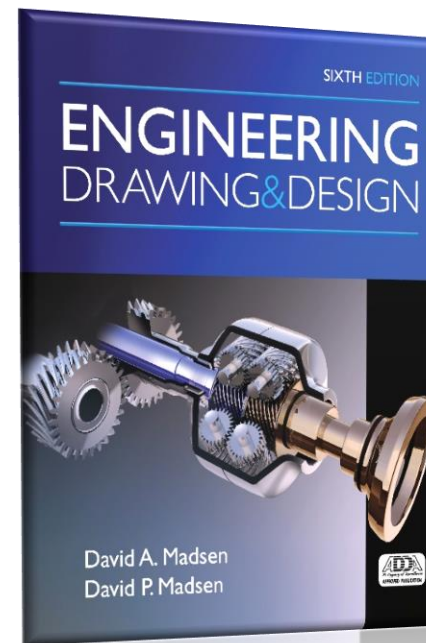
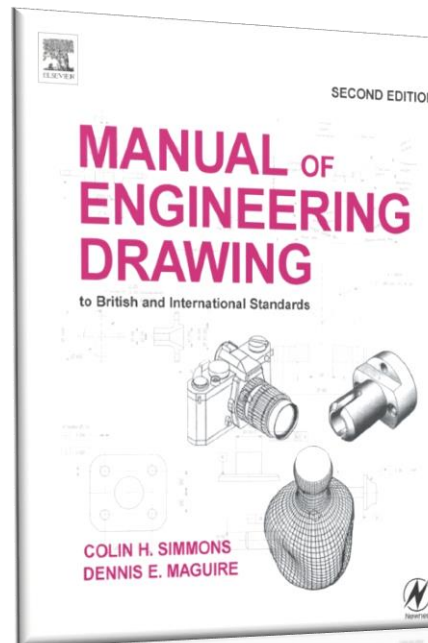
مرجع اصلی درس:

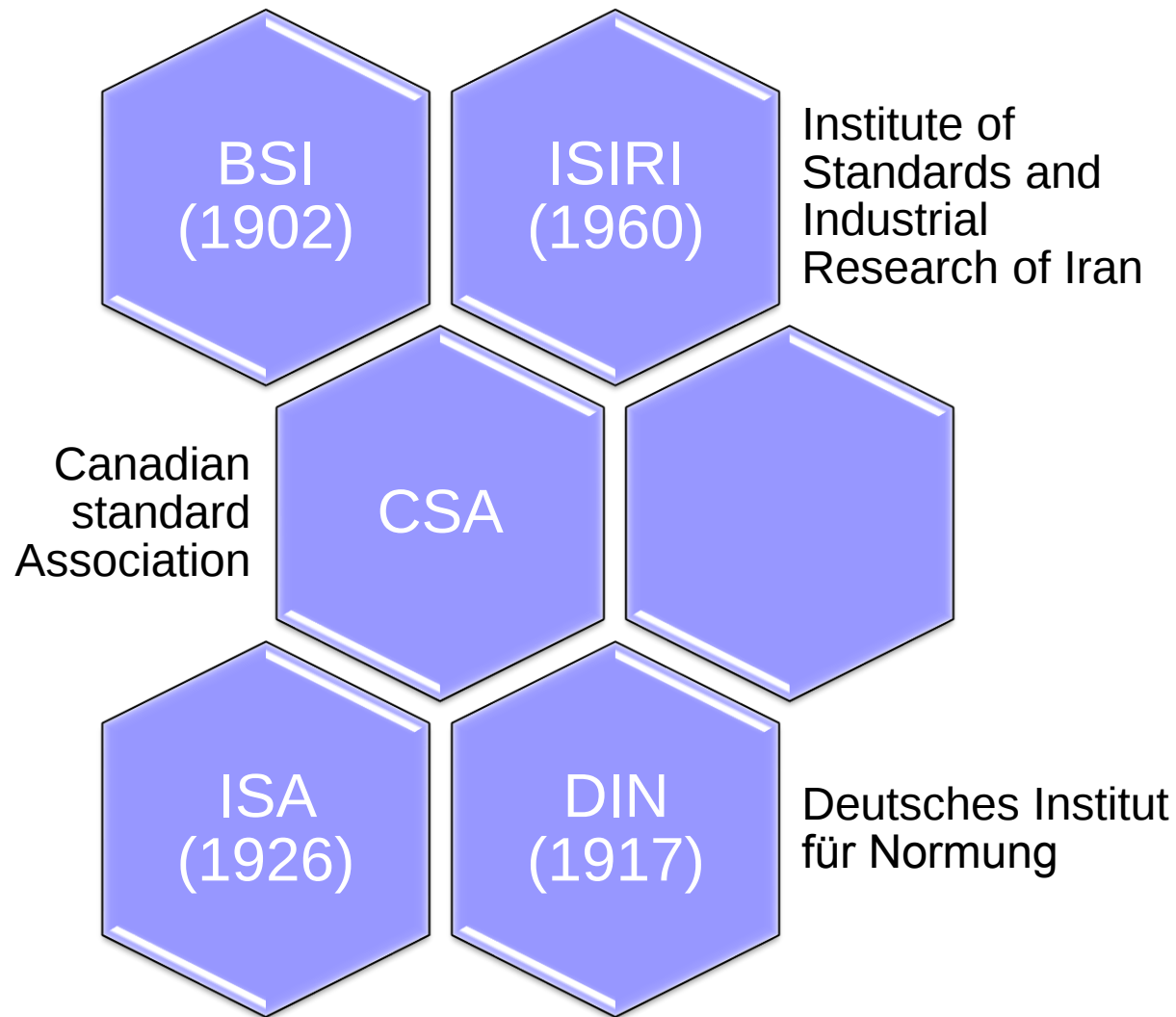
توضیحات و جزوه کلاسی (به صورت پاورپوینت)

آموزش اتوکد به صورت مقدماتی در کلاس بیان می شود. یادگیری با سطح بالاتر می بایست توسط دانشجویان و خارج از کلاس صورت پذیرد.

مراجع کمکی:

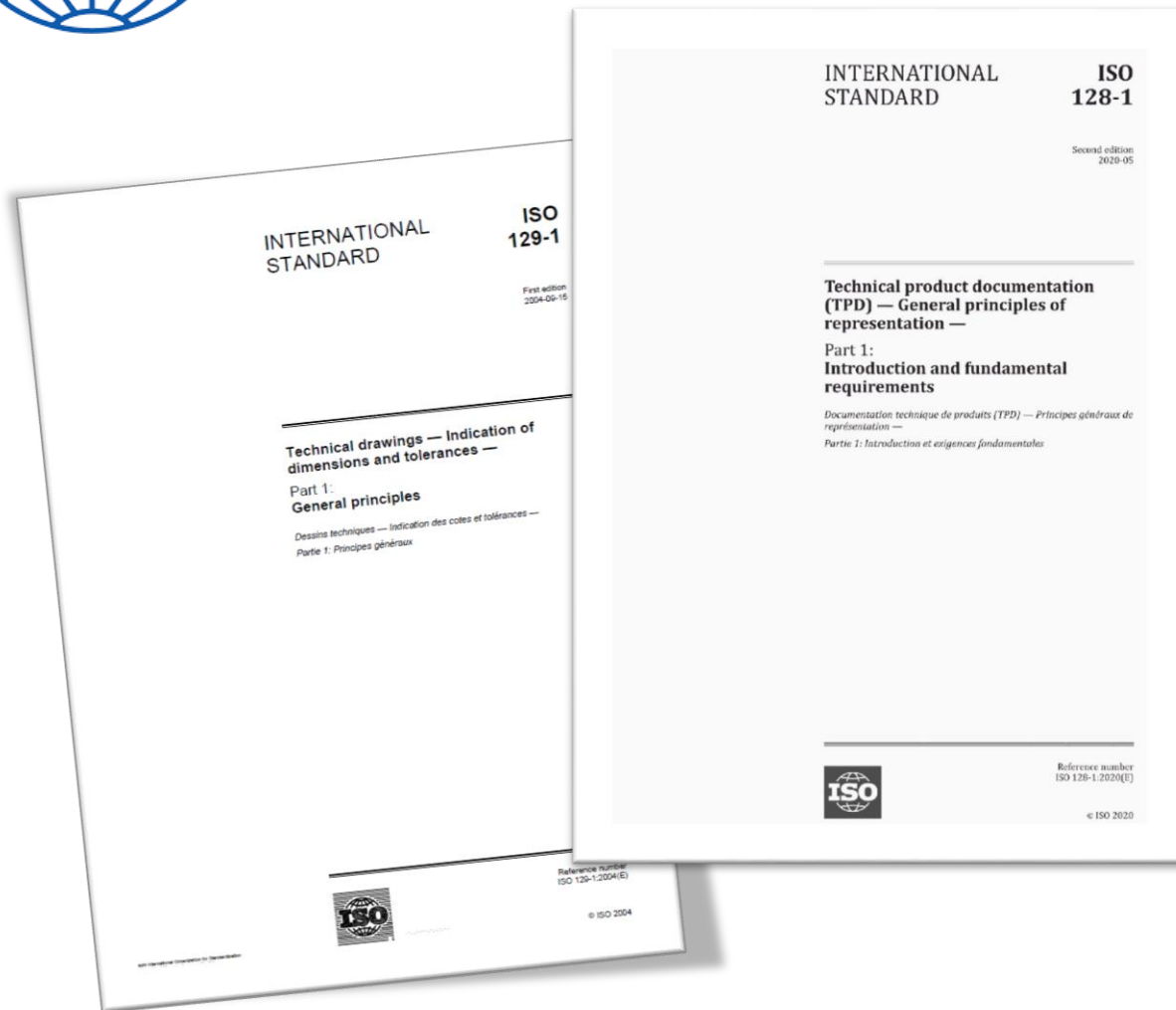
1. Simmons, Colin H., and Dennis E. Maguire. Manual of engineering drawing: Technical product specification and documentation to British and International Standards. Butterworth-Heinemann, 2012.
 2. Madsen, David A., and David P. Madsen. Engineering drawing and design. Nelson Education, 2016.
۳. مهدی متقی پور، نقشه کشی صنعتی ۱ به شیوه مدرن، نشر شریف کد کم

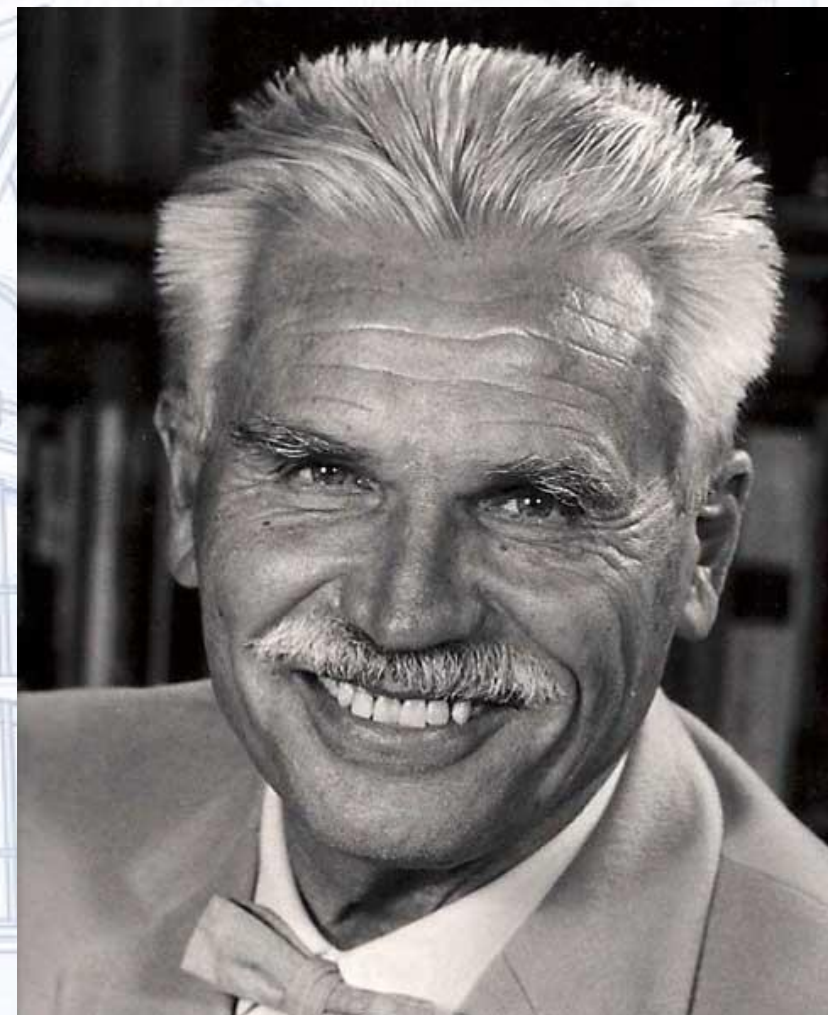
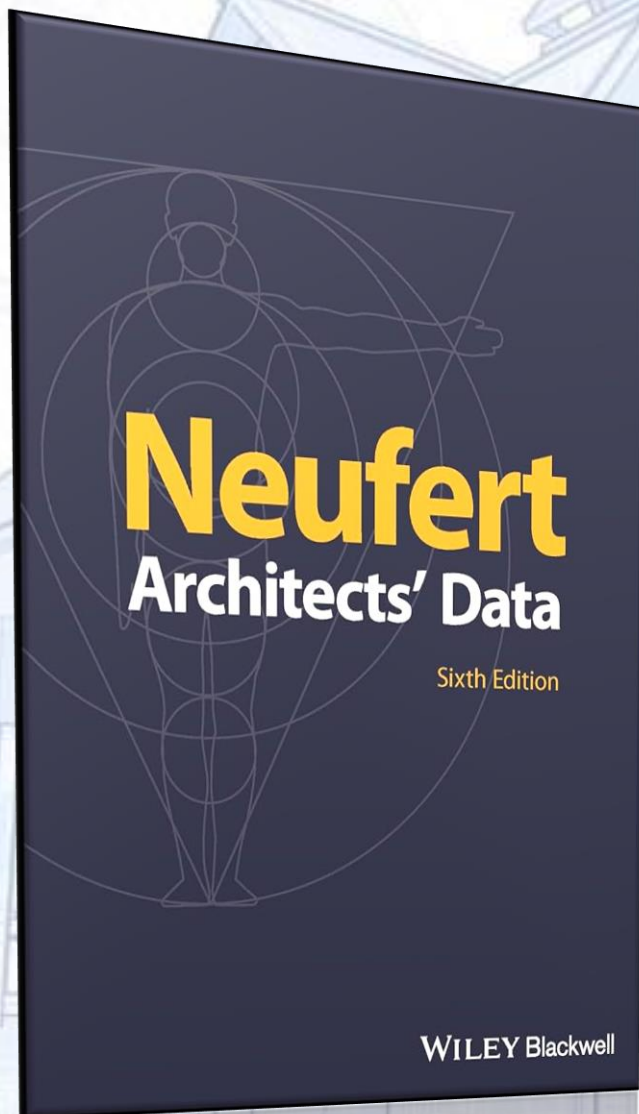




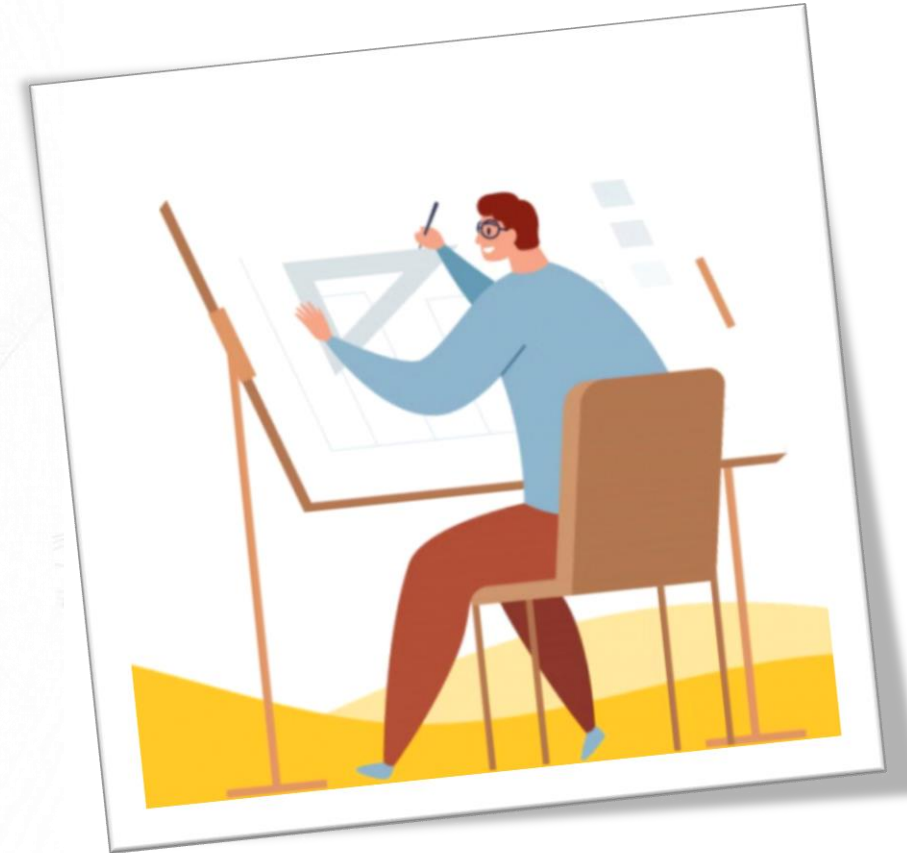
ISO - International Standard Organization (1947)

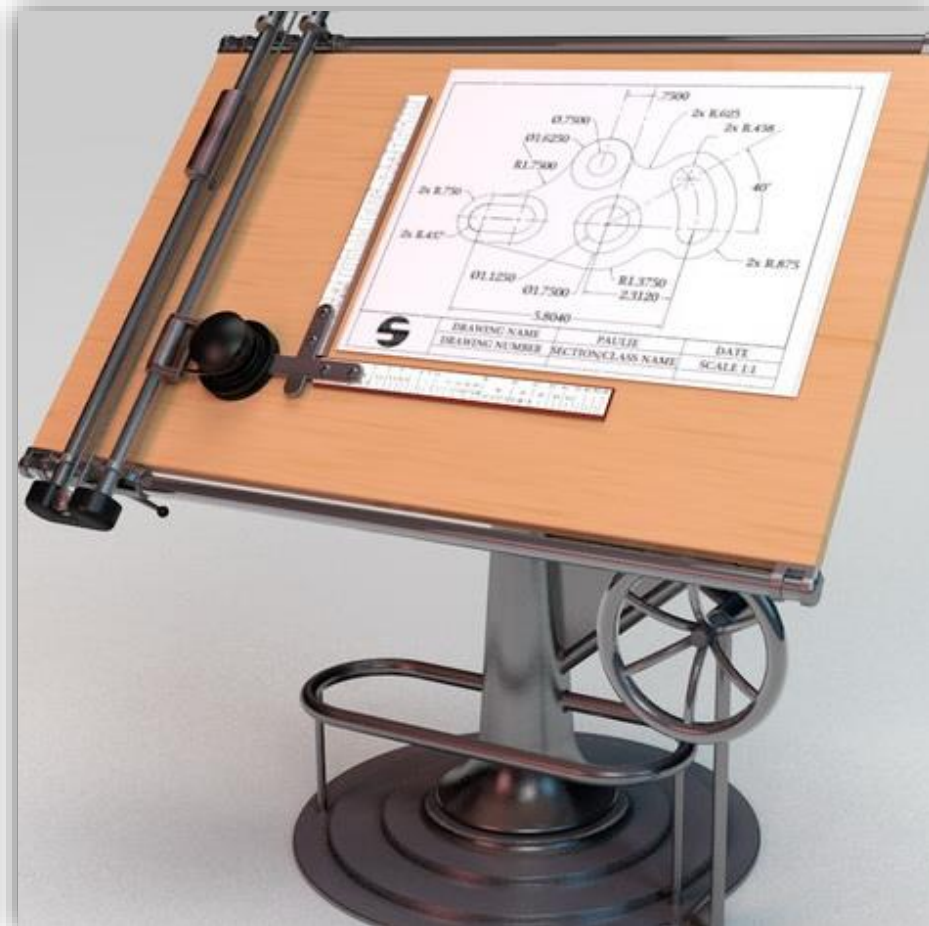






Ernst Neufert (1936)



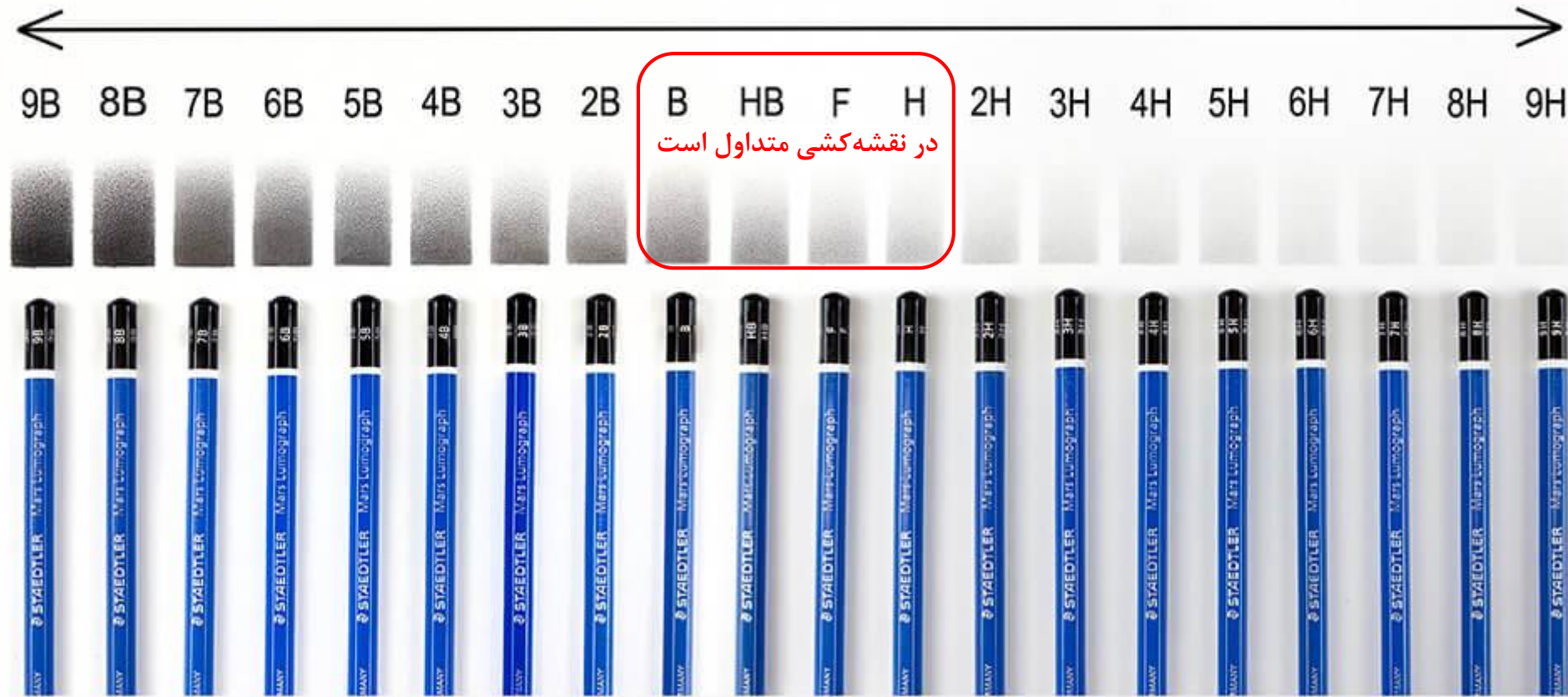


Graphite Pencil Grades

A guide from
TheDrawingSource.com

Softest
Pencil

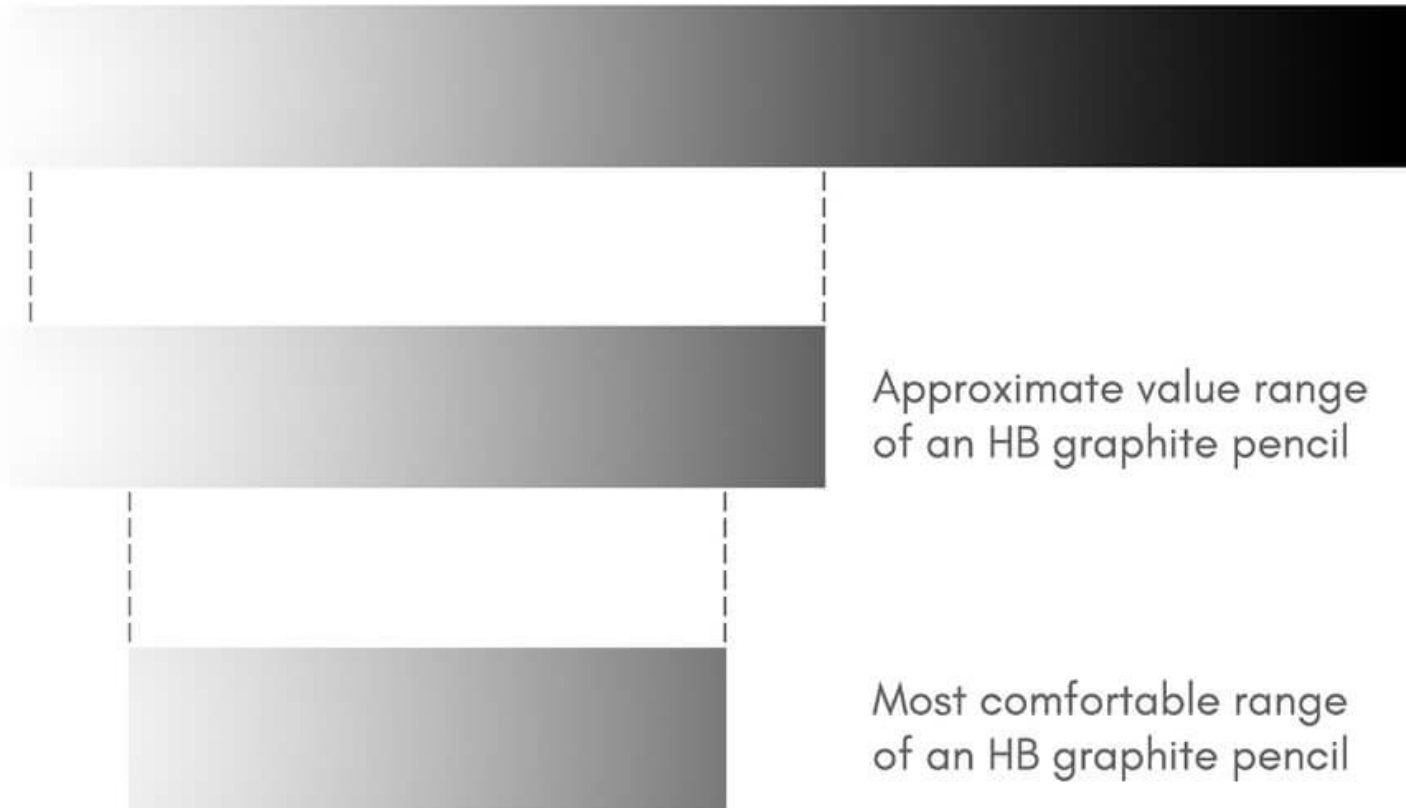
Hardest
Pencil



THE
drawingSource

Value range of an HB Graphite Pencil

Full value range from white to black

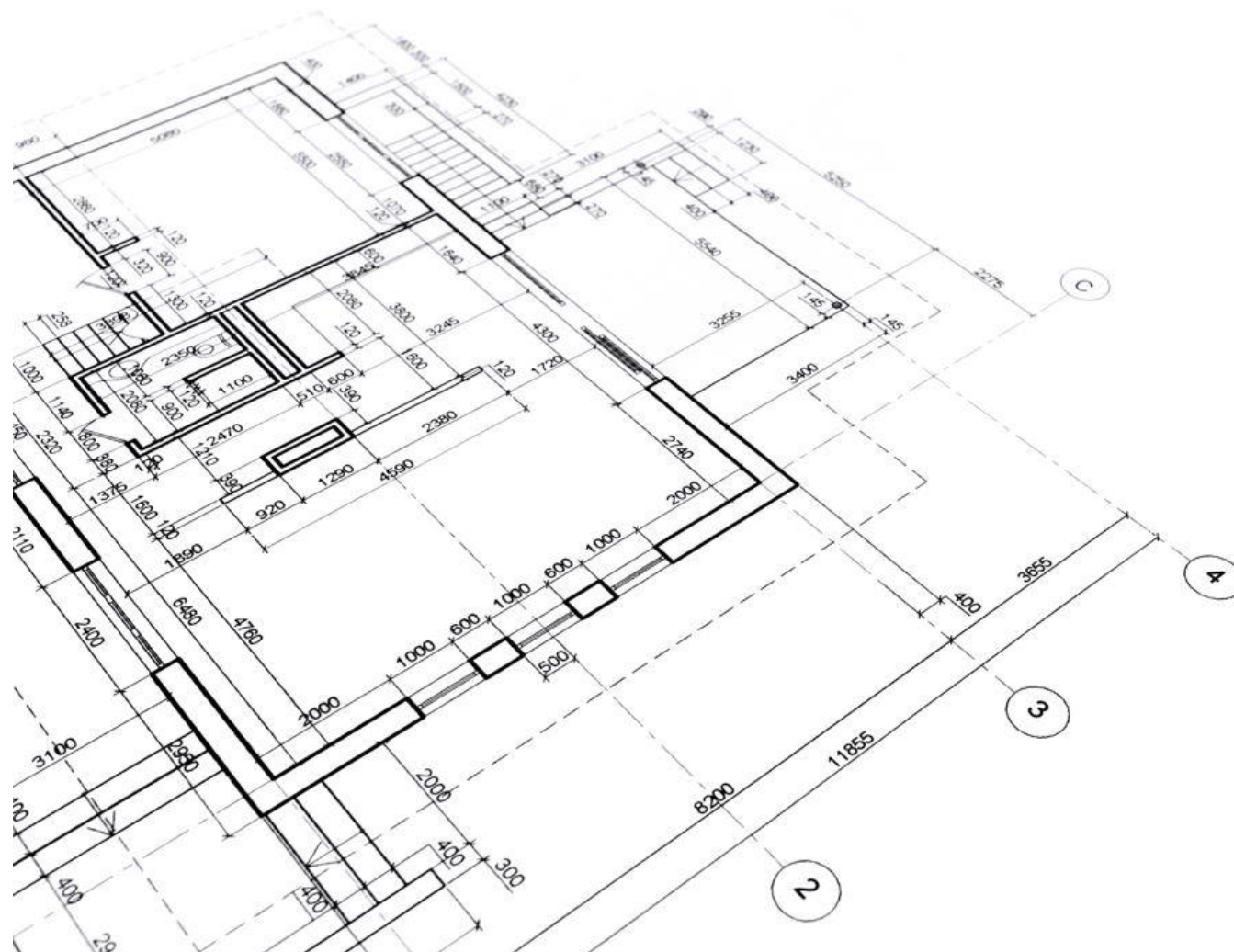


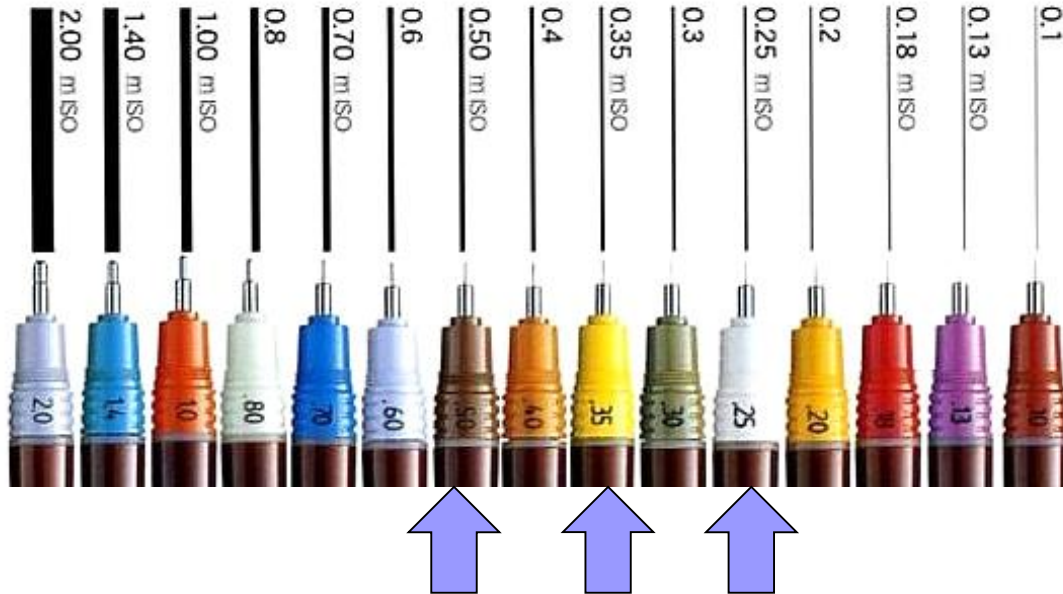
Technical drawing pen size:

https://www.designingbuildings.co.uk/wiki/Paper_Sizes



Note: m ISO = metric ISO





<https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.koraputiti.in%2Fcategory%2Fclass-notice%2Fnotes%2Fengineering-drawing%2F&psig=AOvVaw0DYmIKU0WGczTryn-ti1E&ust=1665496966544000&source=images&cd=vfe&ved=0CA0QjhxqFwoTCODsxerp1foCFQA AAAAdAAAAABAh>

<https://engineeringdrawingbasics.com/different-line-types-used-on-engineering-drawings/>

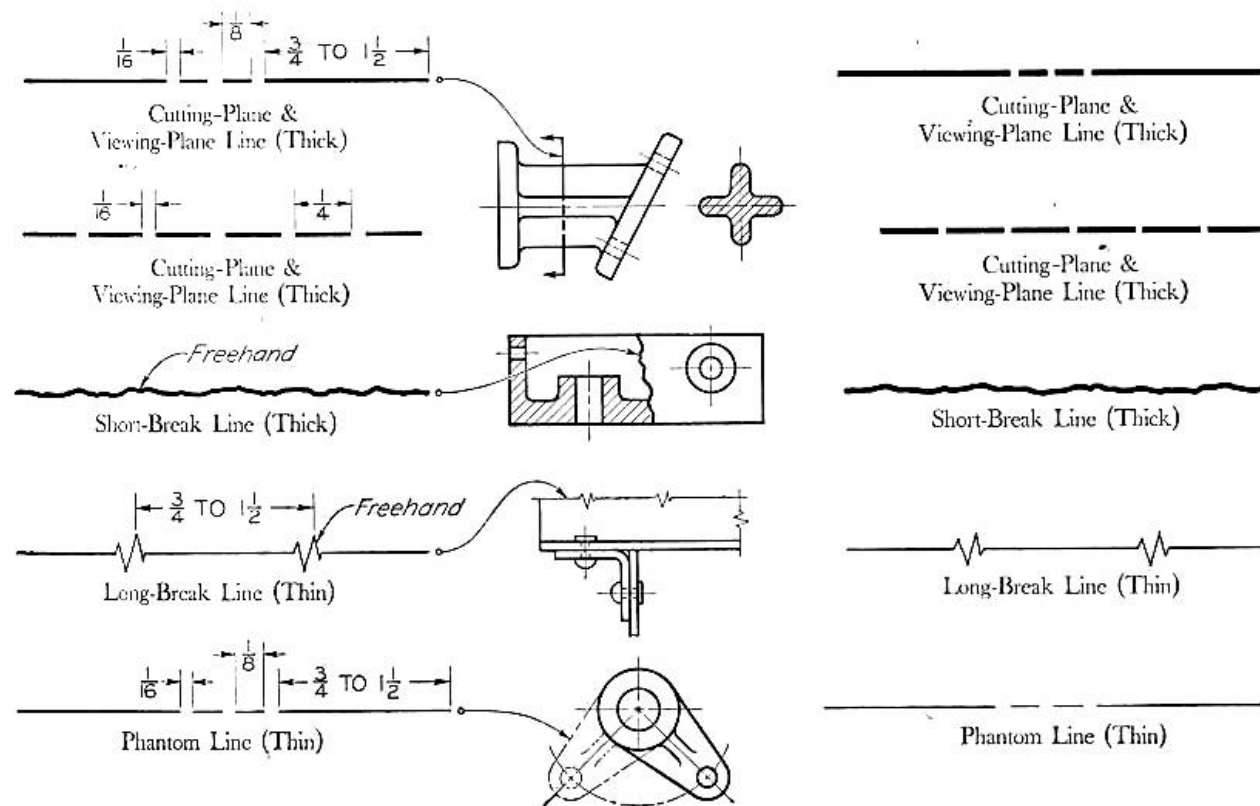
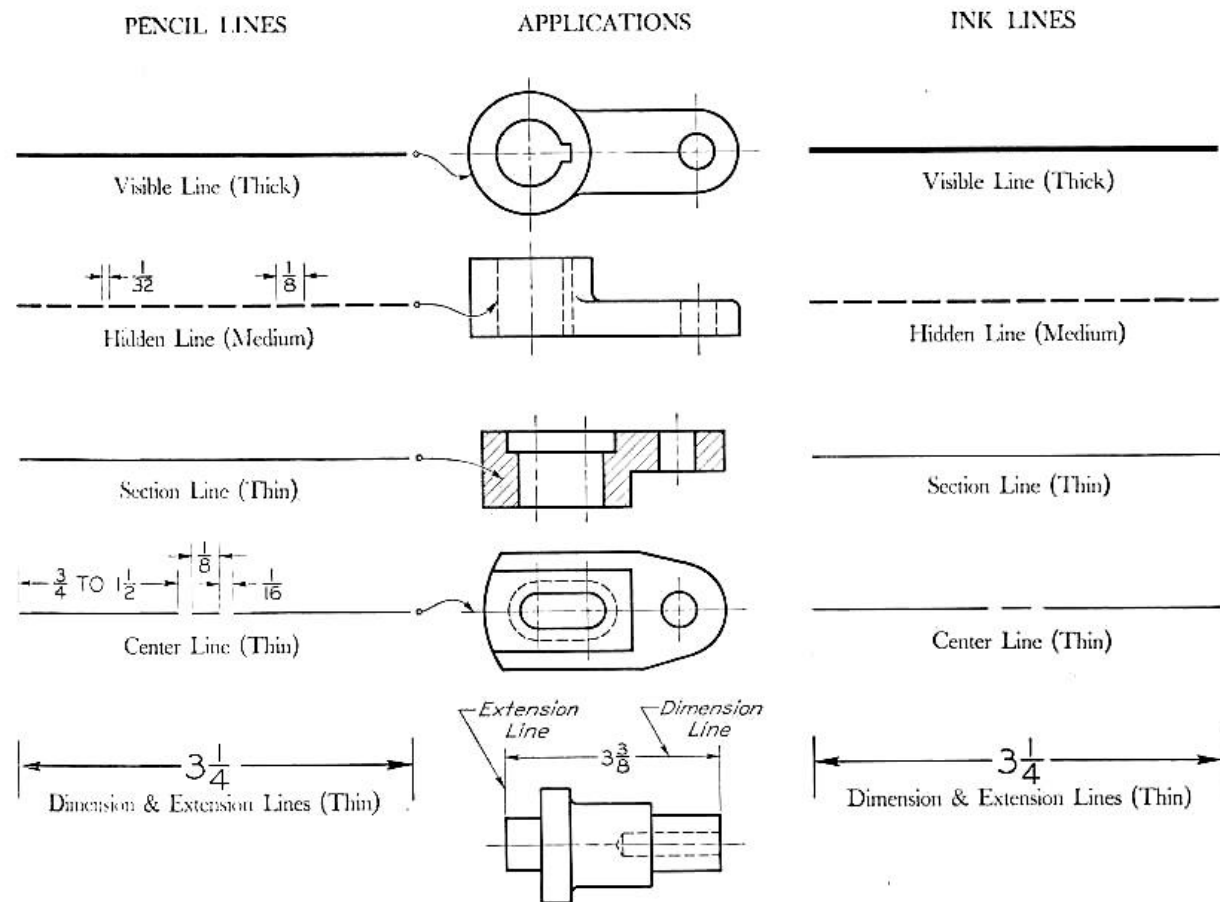
https://www.easynotecards.com/notecard_set/49991

Types of lines and their application

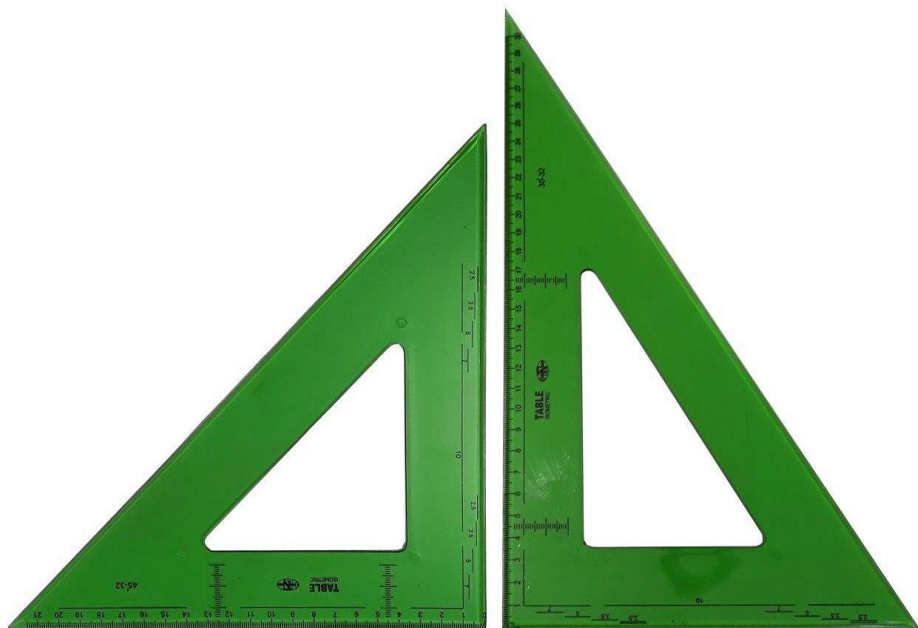
Lines	Description	General applications See figure and other relevant figure
Fig 1 A ————— 0.5	Continuous thick	A1 Visible outlines A2 Visible edges
B ————— 0.2	Continuous thin (straight)	B1 Imaginary lines of intersection B2 Dimension lines B3 projection lines or extension line B4 Leader lines B5 Hatching B6 Outlines of revolved sections in place B7 Short centre lines B8 Thread line B9 Diagonal line
C ~~~~~ 0.2	Continuous thin free hand	C1 Limits of partial or interrupted views & sections, if the limit is not a chain thin
D ———— 0.2	Continuous thin (Straight) with zig-zags	D1 Line (See figures)
E - - - - - 0.3	Dashed thick	E1 Hidden outlines E2 Hidden edges
F - - - - - 0.2	Dashed thin	F1 Hidden outlines F2 Hidden edges
G - . - . - . 0.2	Chain thin	G1 Centre lines G2 Lines of symmetry G3 Trajectories
H - - - - - 0.3	Chain thin, thick at ends & changes of direction	H1 Cutting planes
J - - - - - 0.5	Chain thick	J1 Indication of lines or surfaces to which a special requirement applies
K - . - . - . 0.2	Chain thin double-dashed	K1 Outlines of adjacent parts K2 Alternative and extreme positions of movable parts K3 Centroidal lines K4 Initial outlines prior to forming K5 Parts situated in front of the cutting plane

1 This type of line is suited for production of drawings by machines.

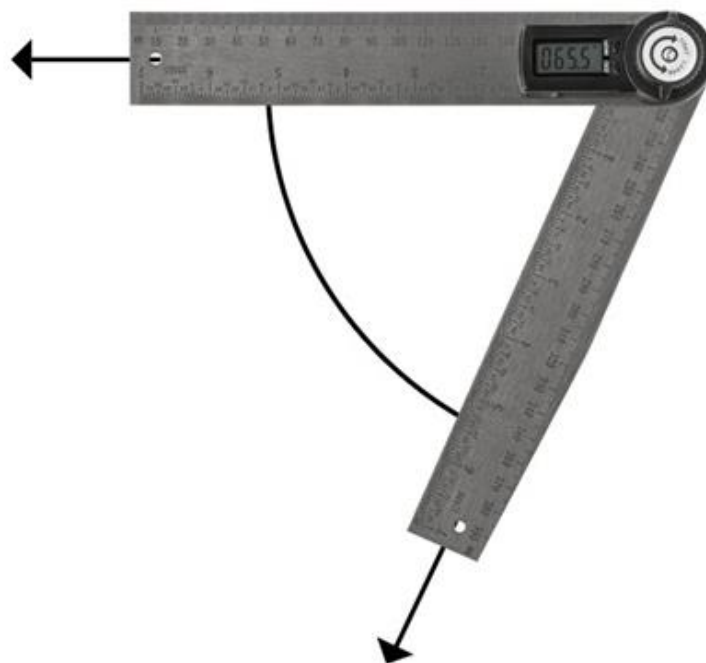
2 Although two alternatives are available, it is recommended that on any one drawing. Only one type of line be used.



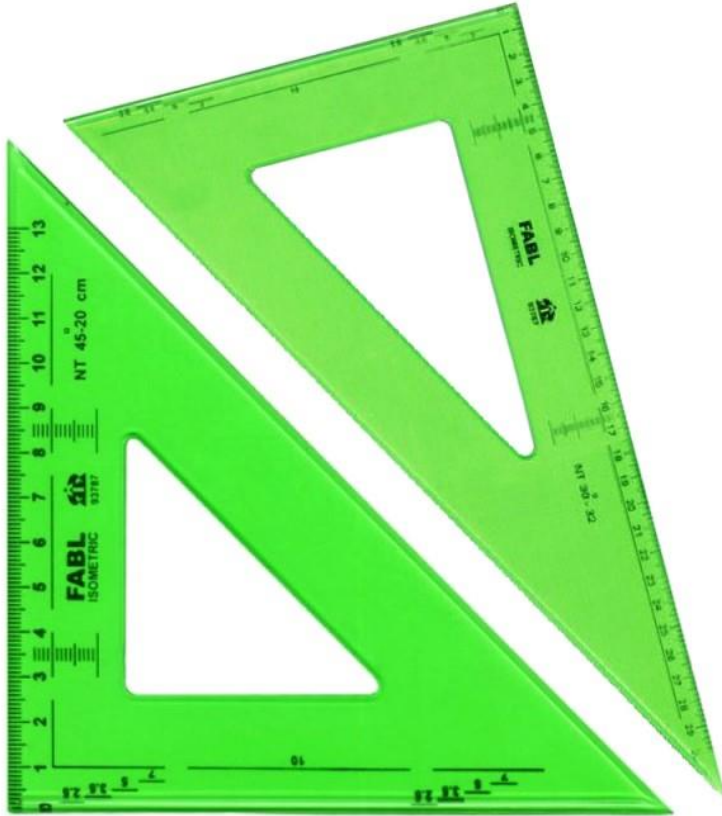
گونیا



گونیاى ثابت

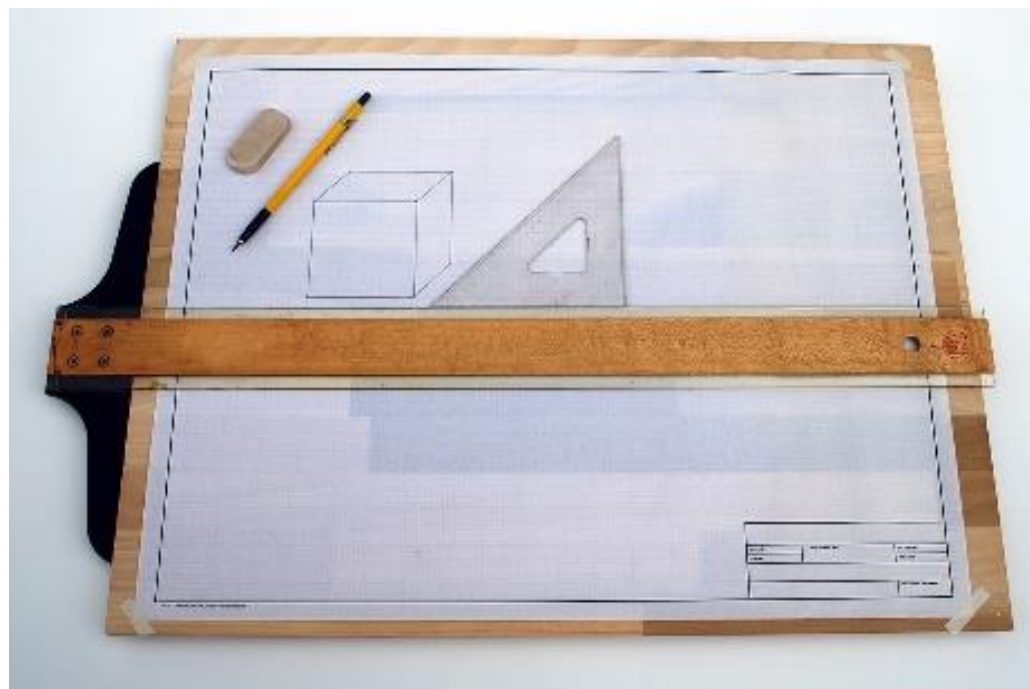


گونیاى متغير

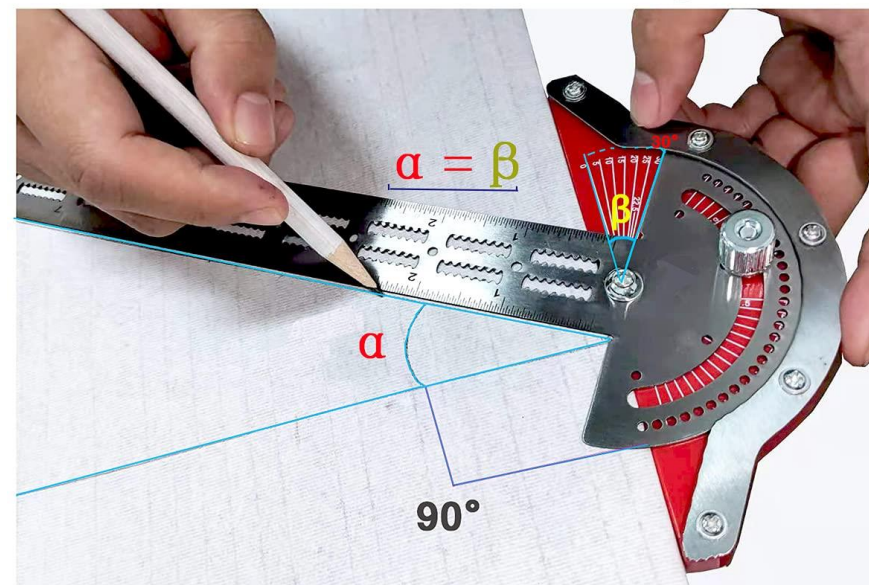


حداقل زاویه‌ای که می‌توان با گونیای ۳۰-۶۰ و ۴۵ رسم کرد چیست؟

خط کش تی

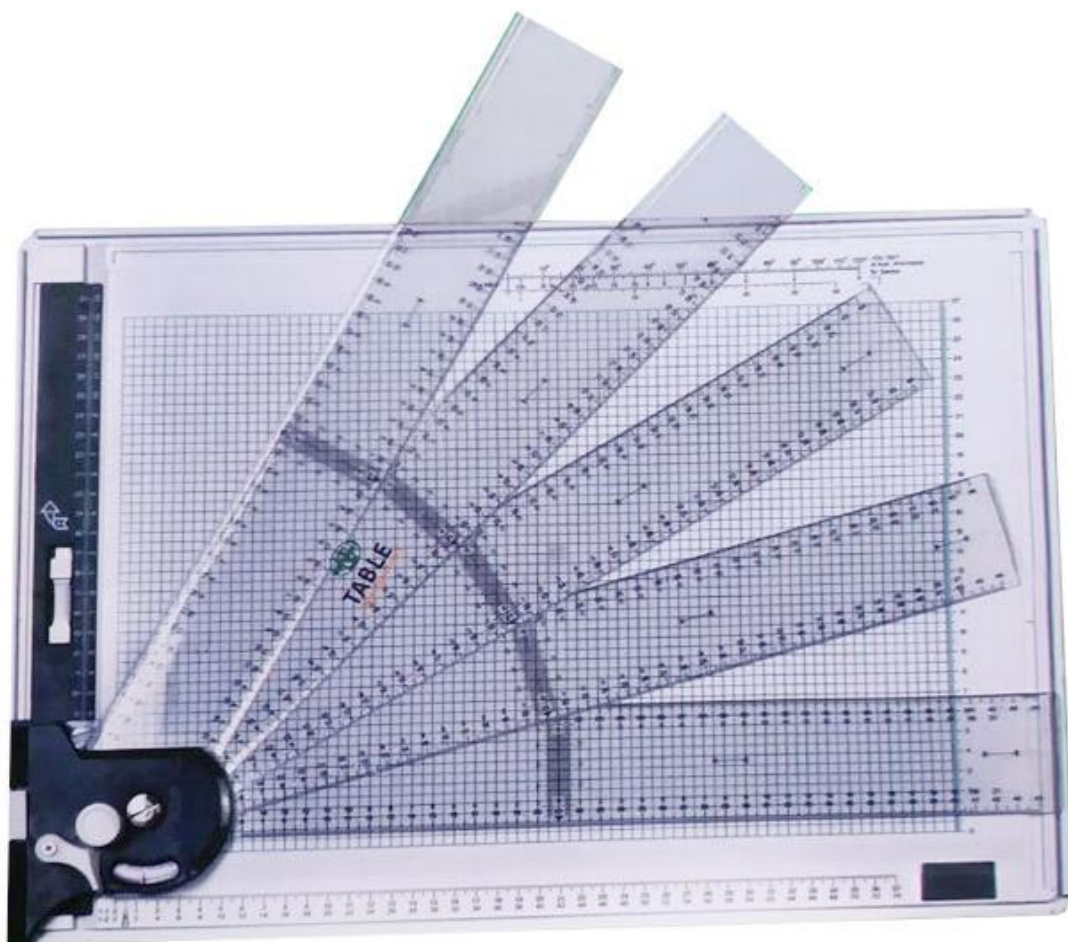


How to Find an Angle



Fix the angle plate of the woodworking ruler on the edge of the wood, and then rotate the ruler to get the angle you want

میز نقشه کشی و تخته رسم

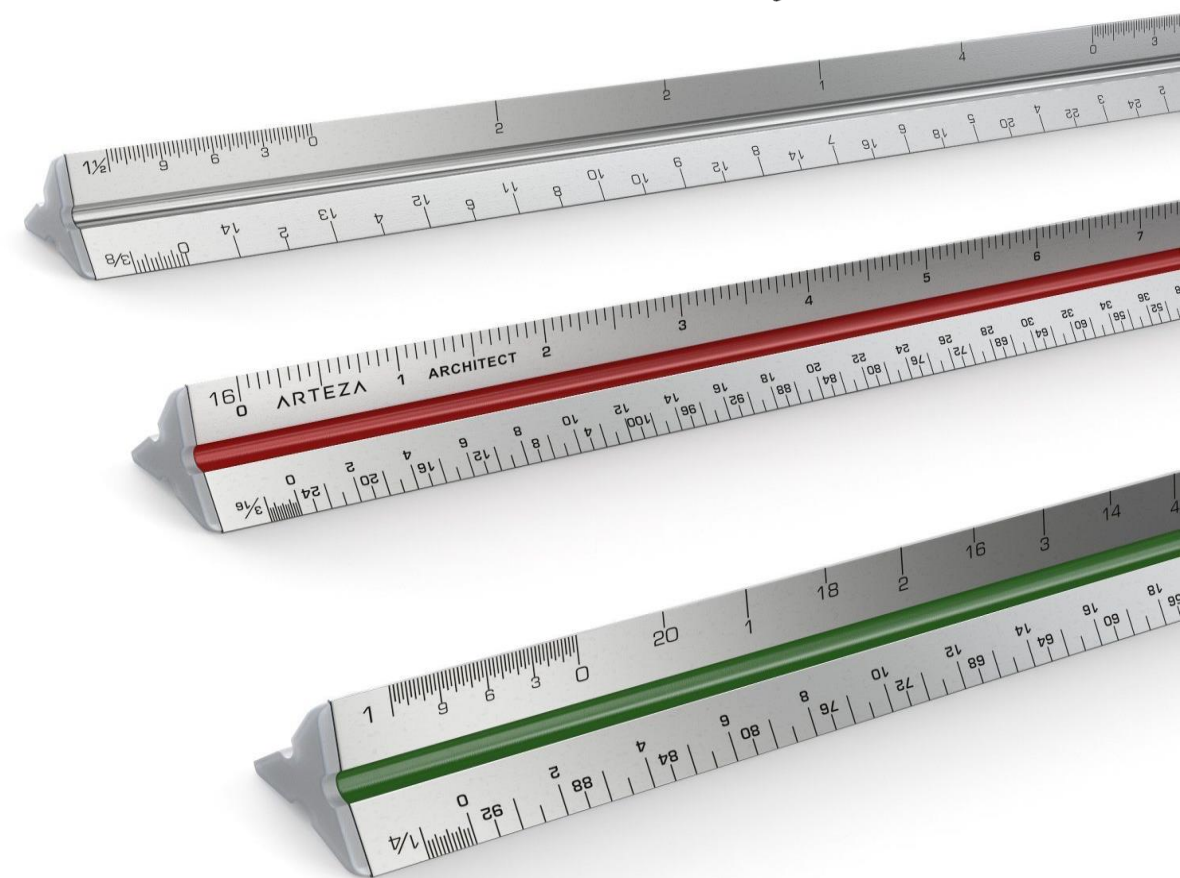
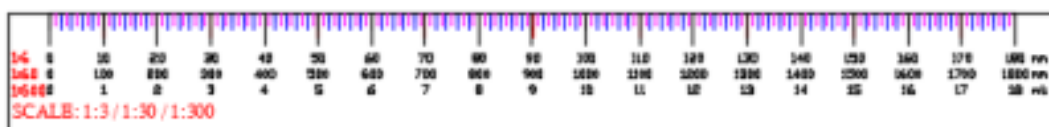
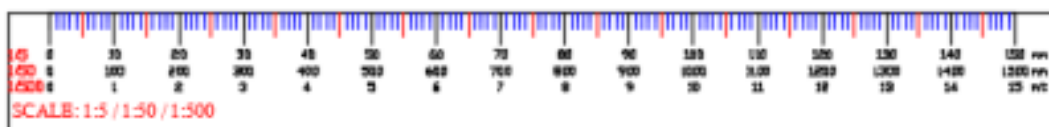
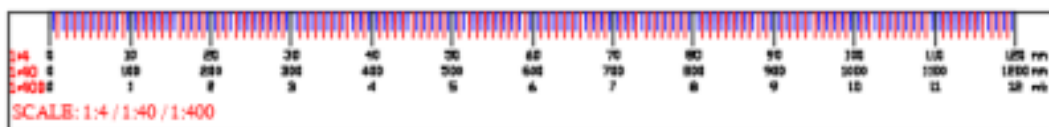
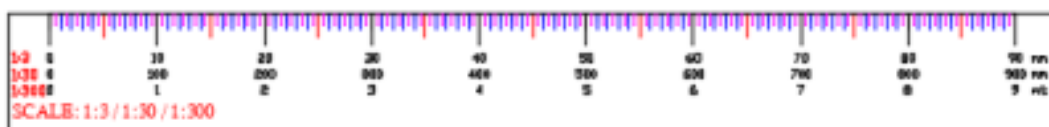
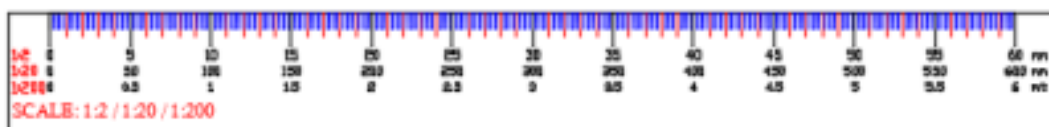
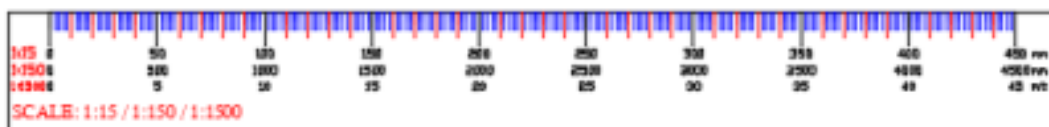
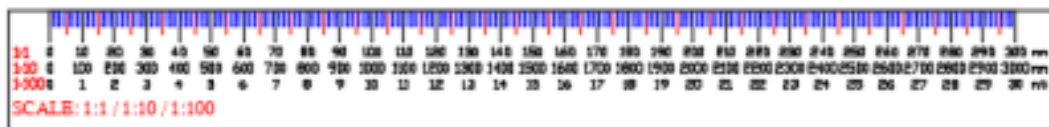


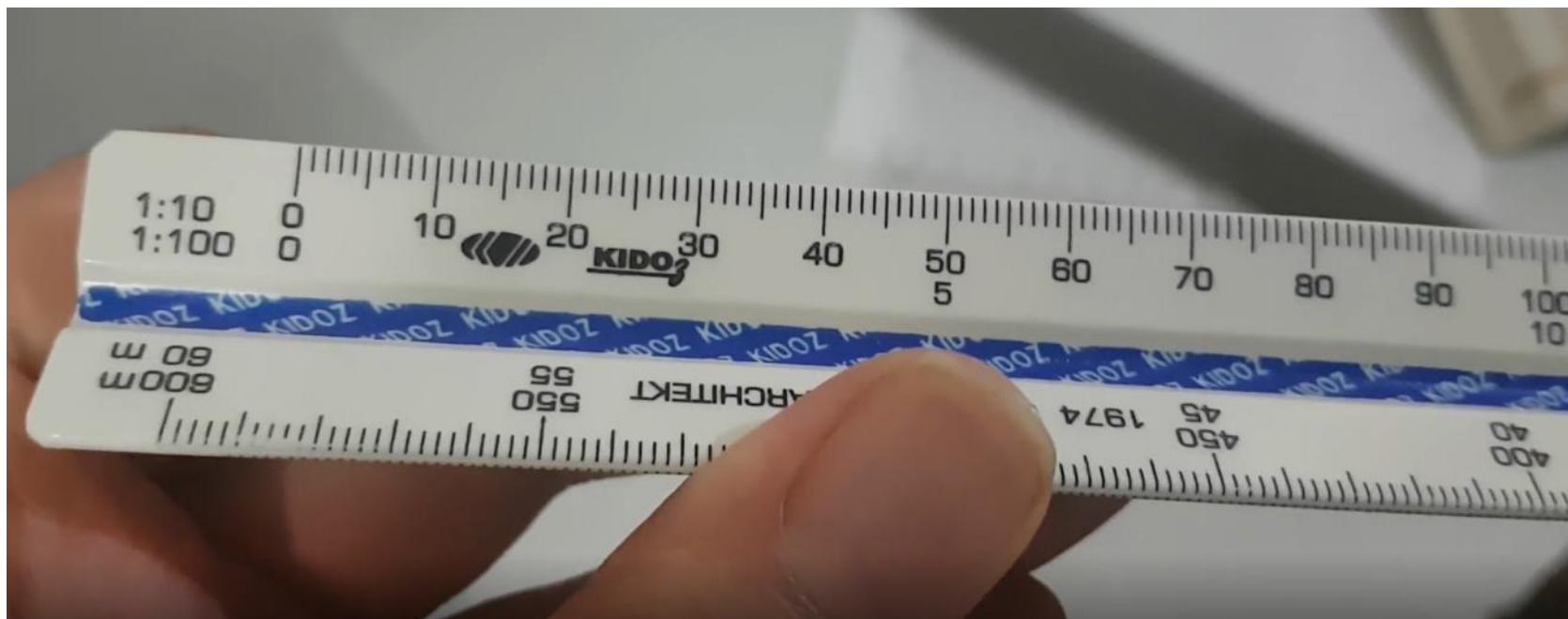
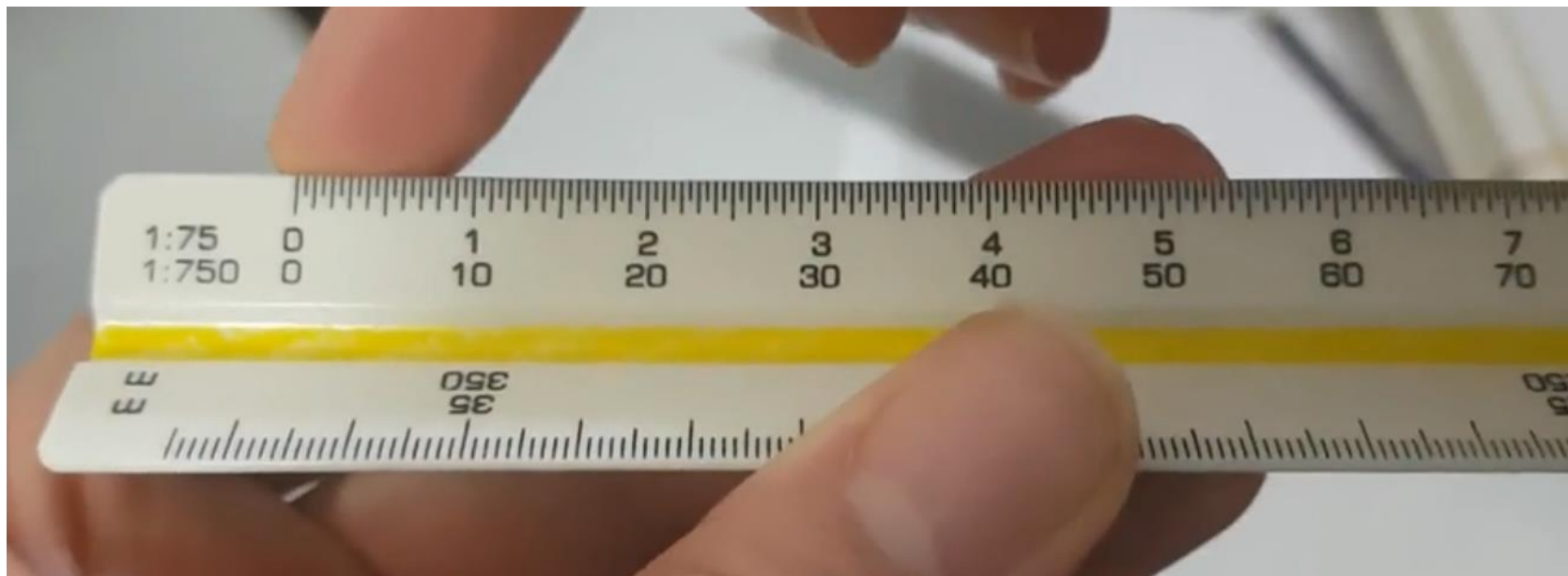
تخته رسم



میز نقشه کشی

اشل

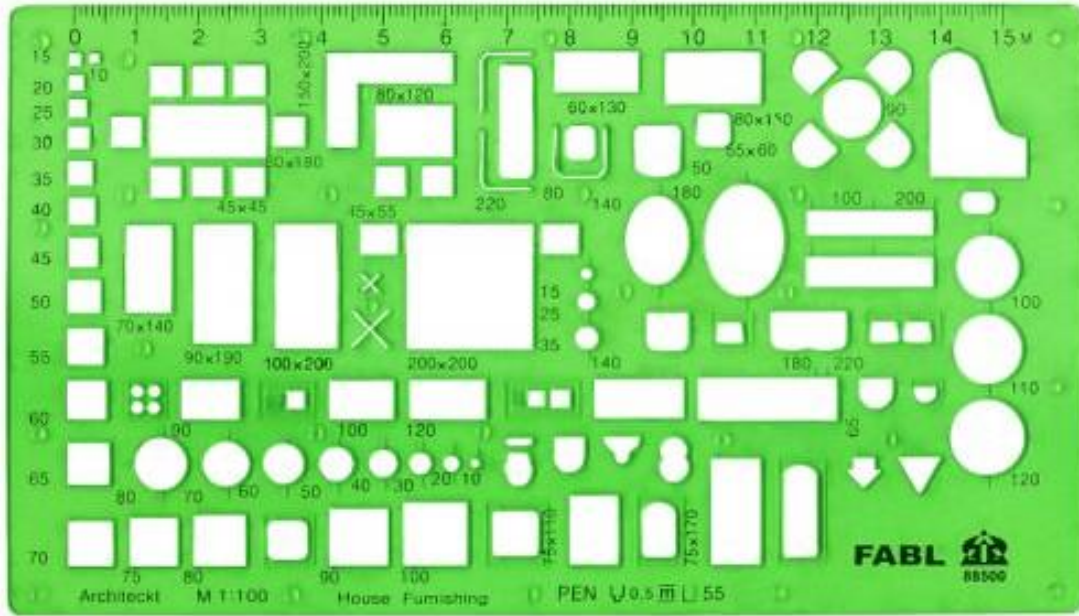




پرگار



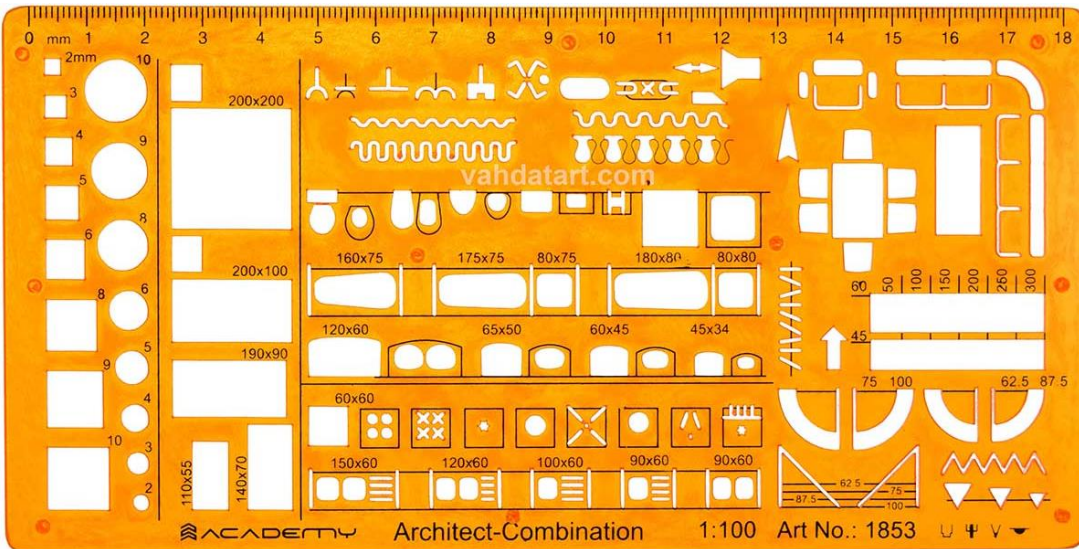
پرگار اندازه گیر: برای انتقال اندازه ها



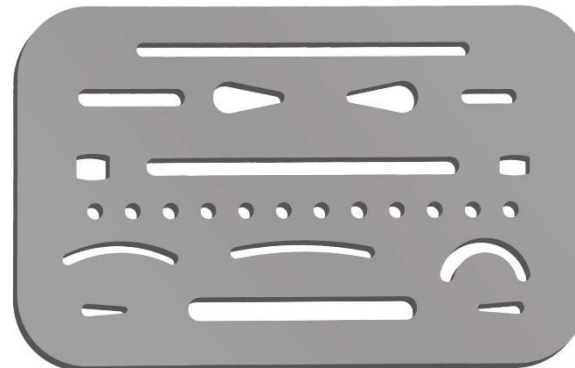
شابلون پیستوله - منحنی کش



ماری کش



شابلون معماری

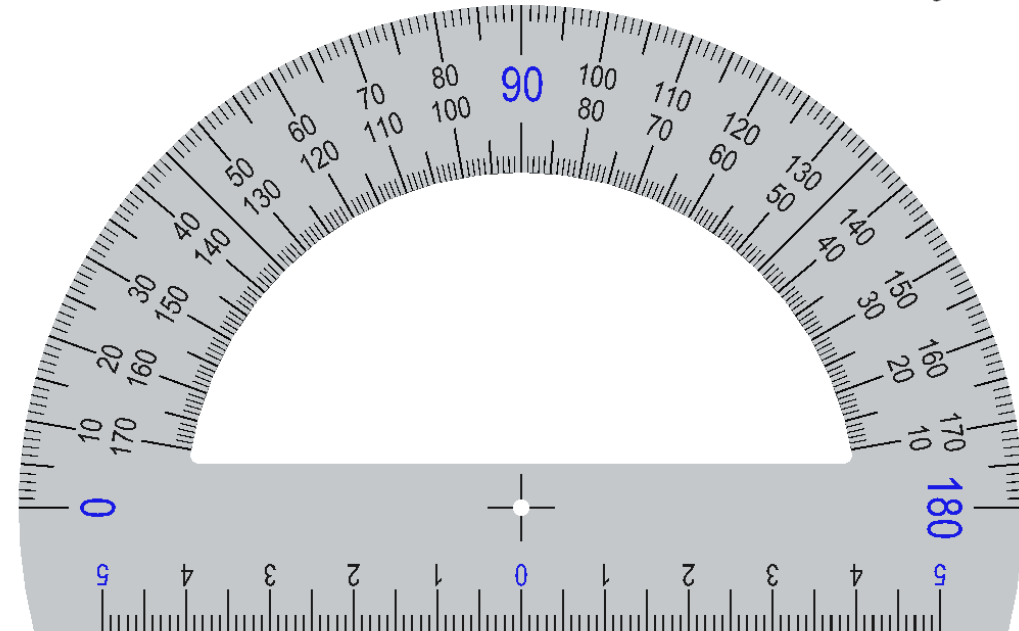
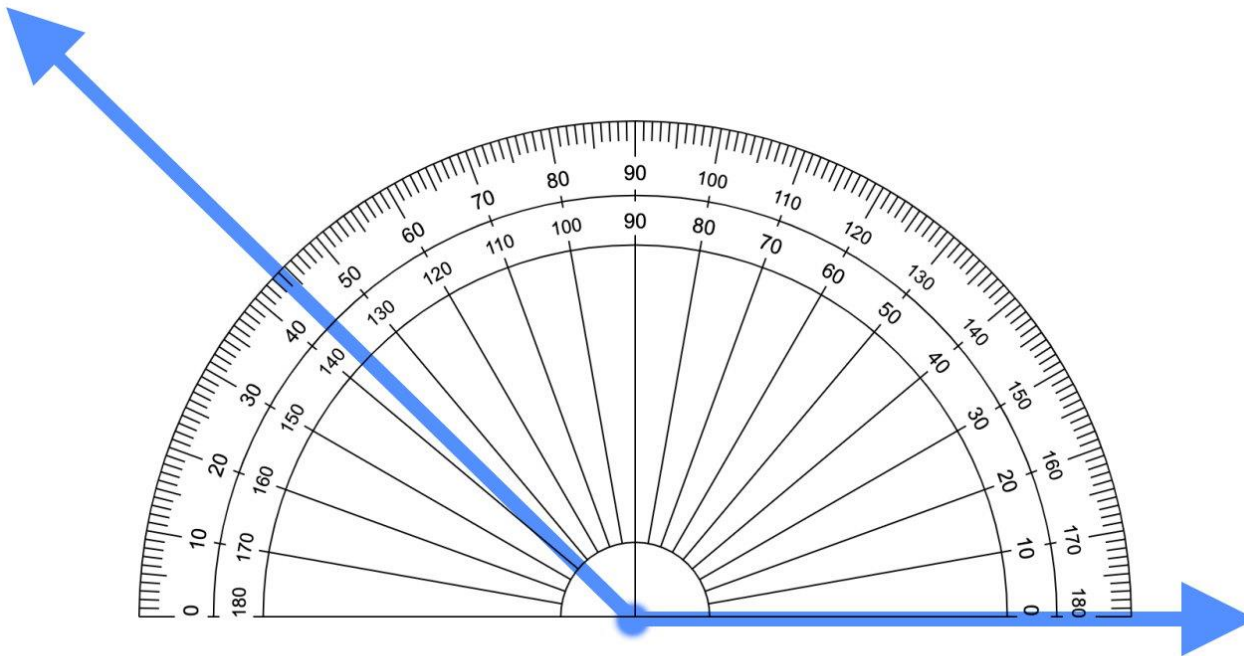


شابلون پاک کن

شابلون



نقاله



برس



چسب



چسب پلاستیکی



چسب کاغذی

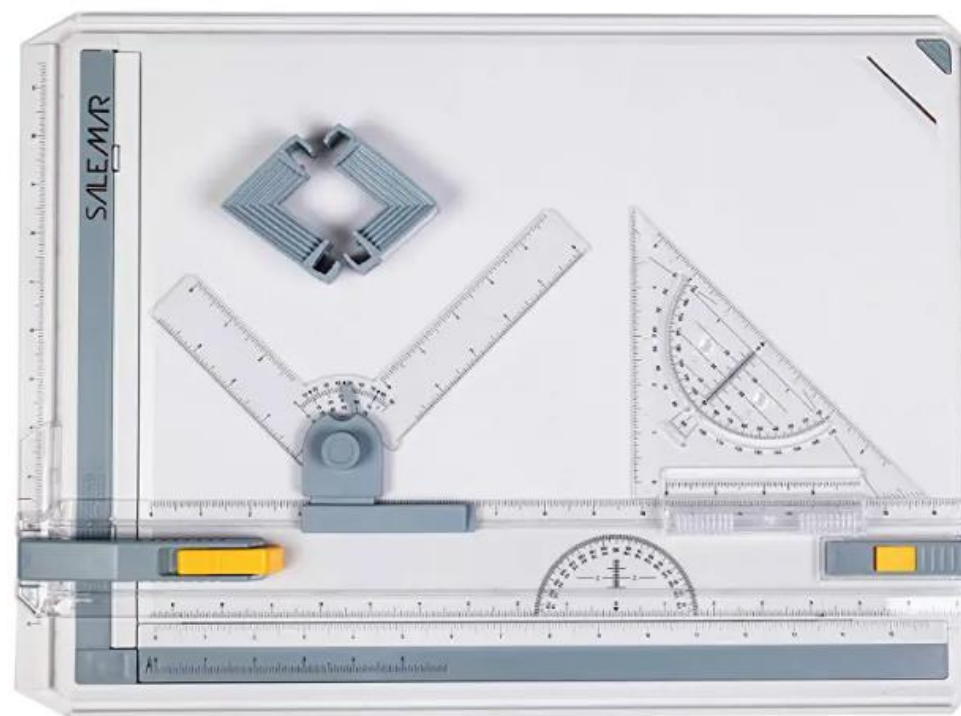


چسب کالک

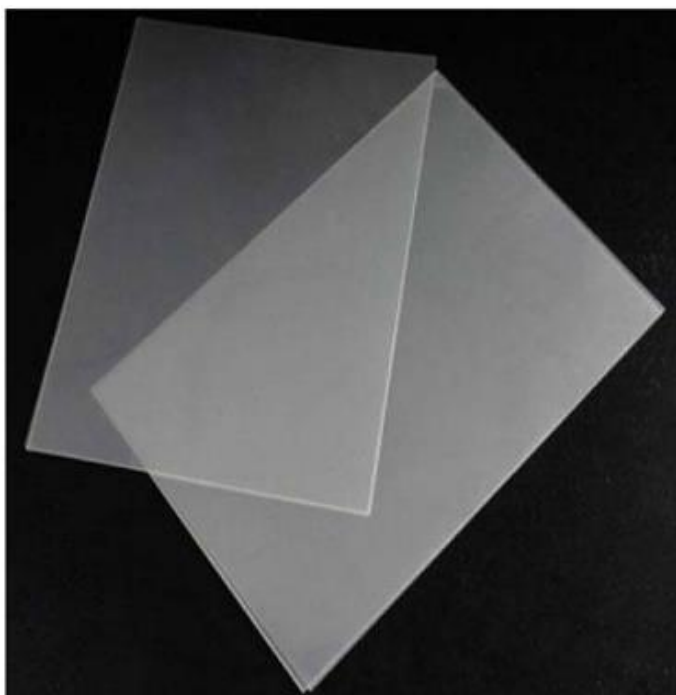
درفتینگ



میز نقشه کشی



کاغذ



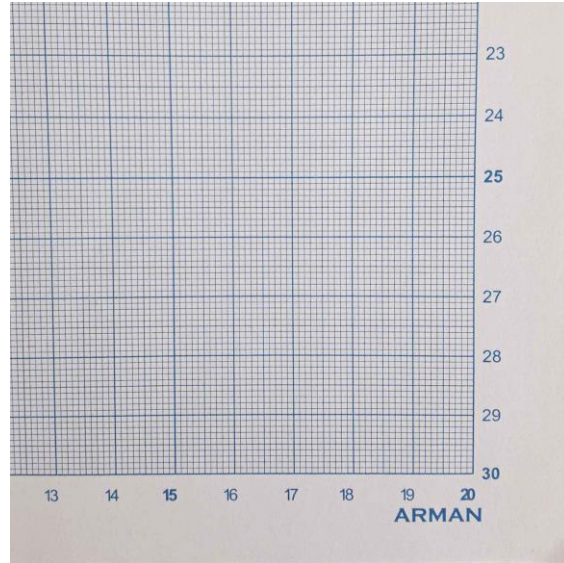
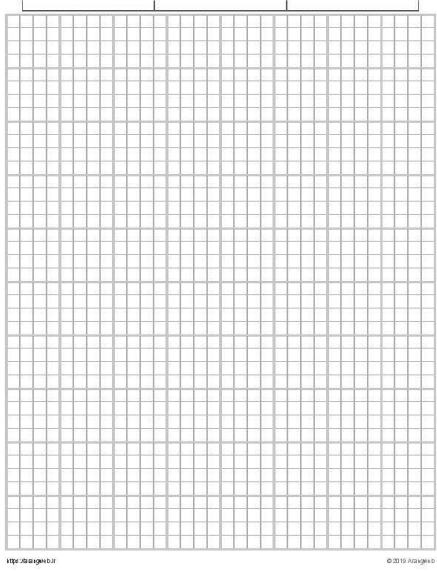
کاغذ کالک



کاغذ پوستی

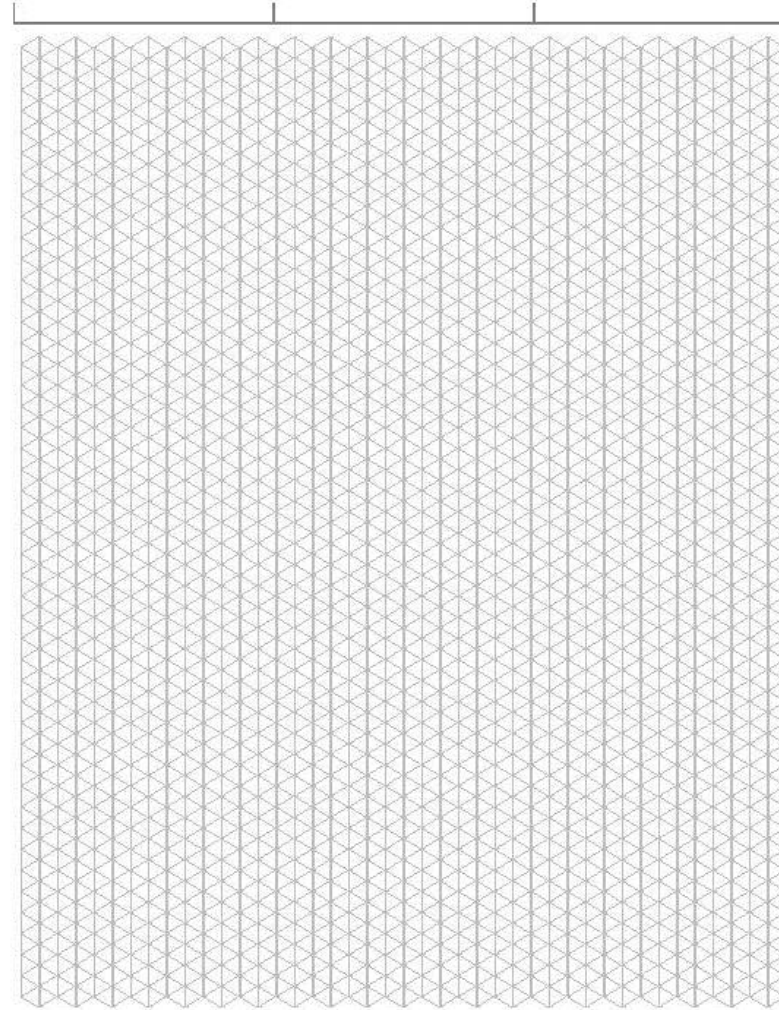


کاغذ سفید

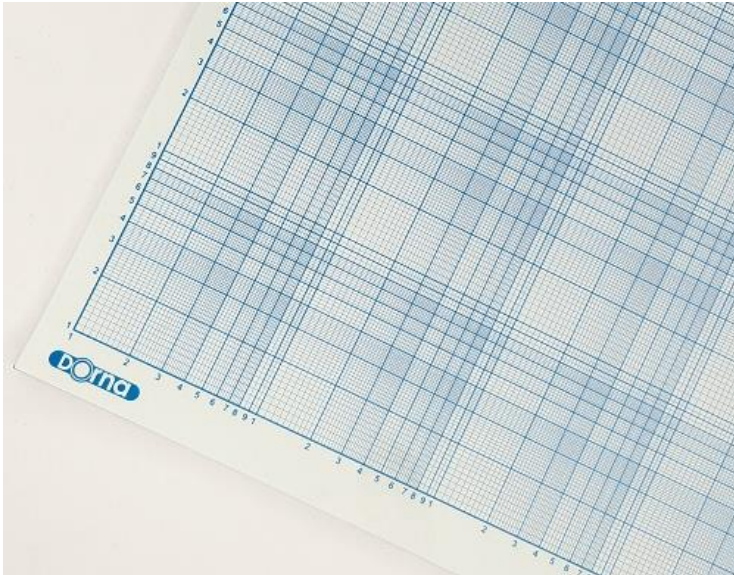


کاغذ میلیمتری

کاغذ شطرنجی (برای نقشه‌های اسکچ)



کاغذ ایزومتریک



کاغذ لگاریتمی

کاغذ



Paper Size:

https://www.designingbuildings.co.uk/wiki/Paper_Sizes

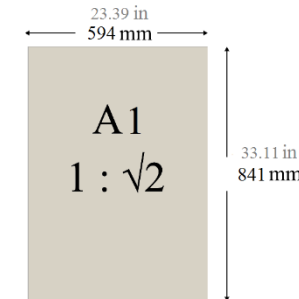
The ISO 216 standard defines the "A" and "B" series of paper sizes.

The ISO 269 "C" series is commonly listed alongside the A and B sizes.

The A-series was derived from a rectangle piece of paper (A0) having an area of 1 m², the length of whose sides are in the proportion 1:√2 (1:1.4142).

The area of B size sheets are the geometric mean of successive A-series sheets. For instance, the area of the B1 sheet (0.707 m²) is in between A0 (1 m²) and A1 (0.5 m²). The B Series is used for passports, envelopes and posters. B5 has become a conventional size for many books.

The entire C-series suite of envelopes are designed to hold their A-series' counterparts, and are defined by ISO 269. The area of C series sheets is the geometric mean of the areas of the A and B series sheets of the same number. So, the area of a C4 sheet is the geometric mean of the areas of an A4 sheet and a B4 sheet.

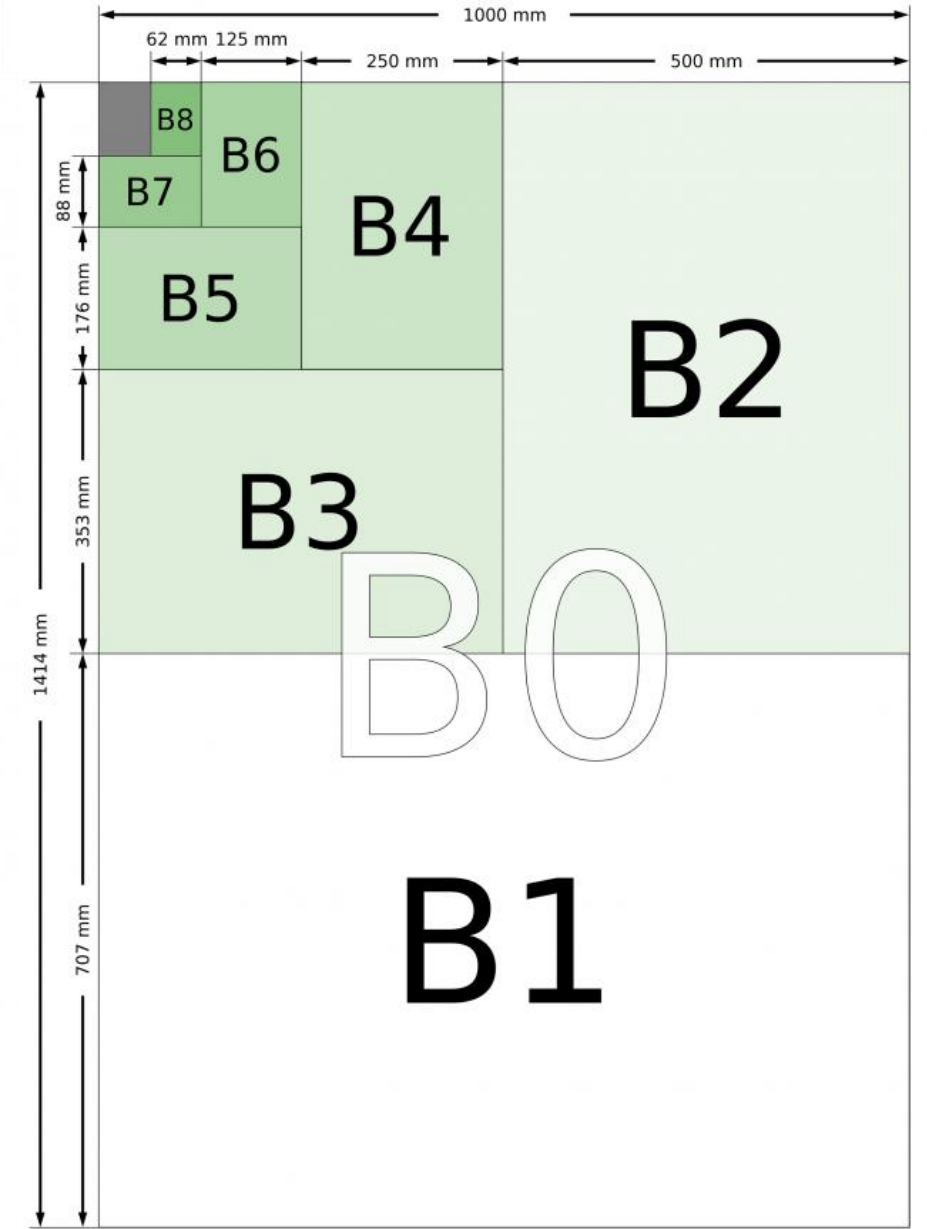
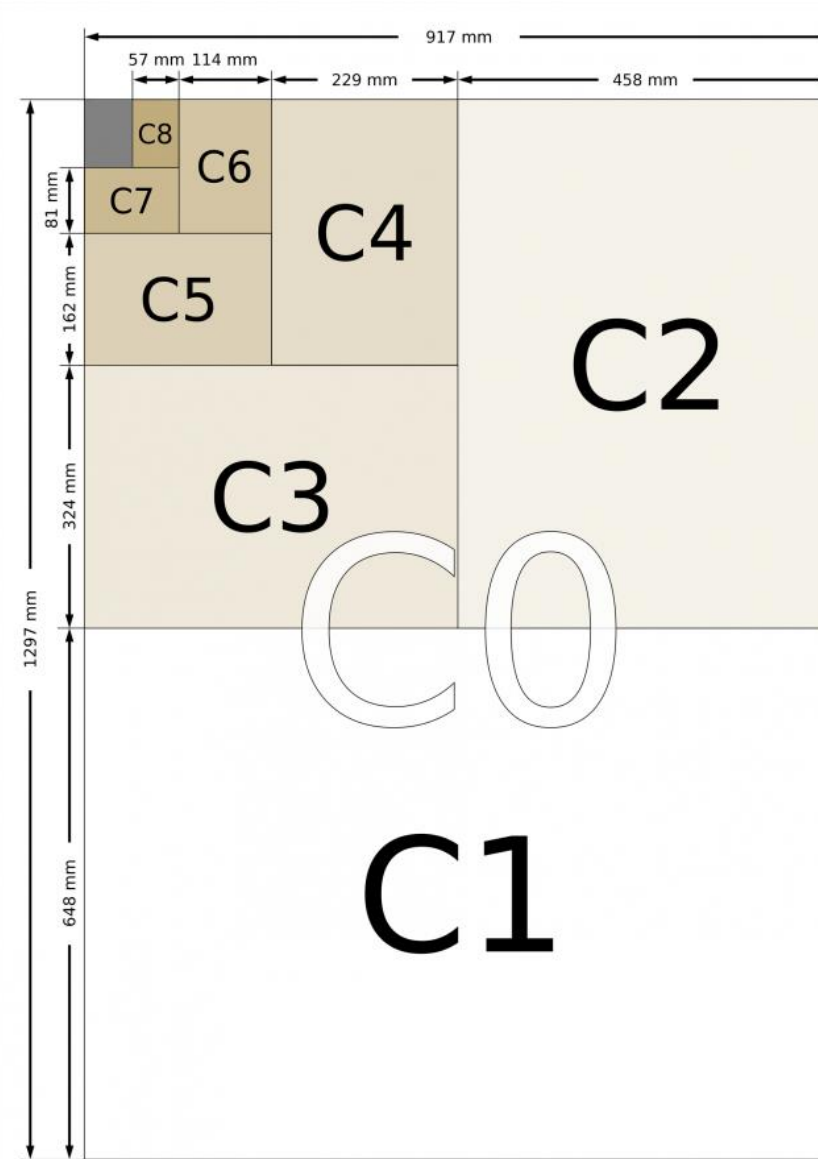
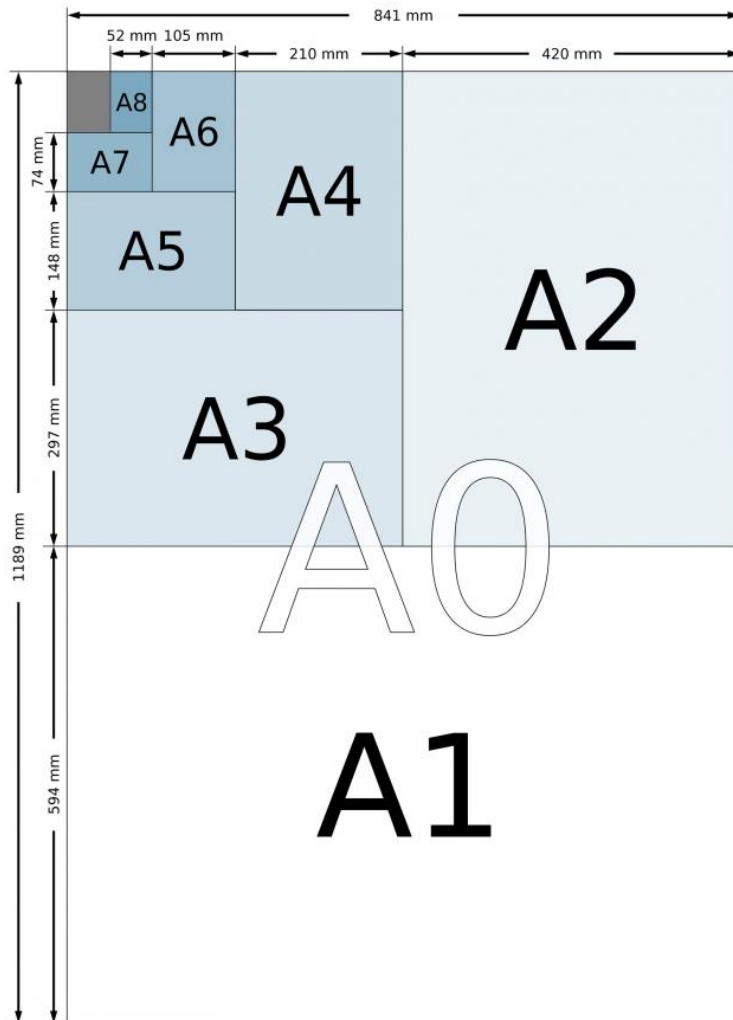


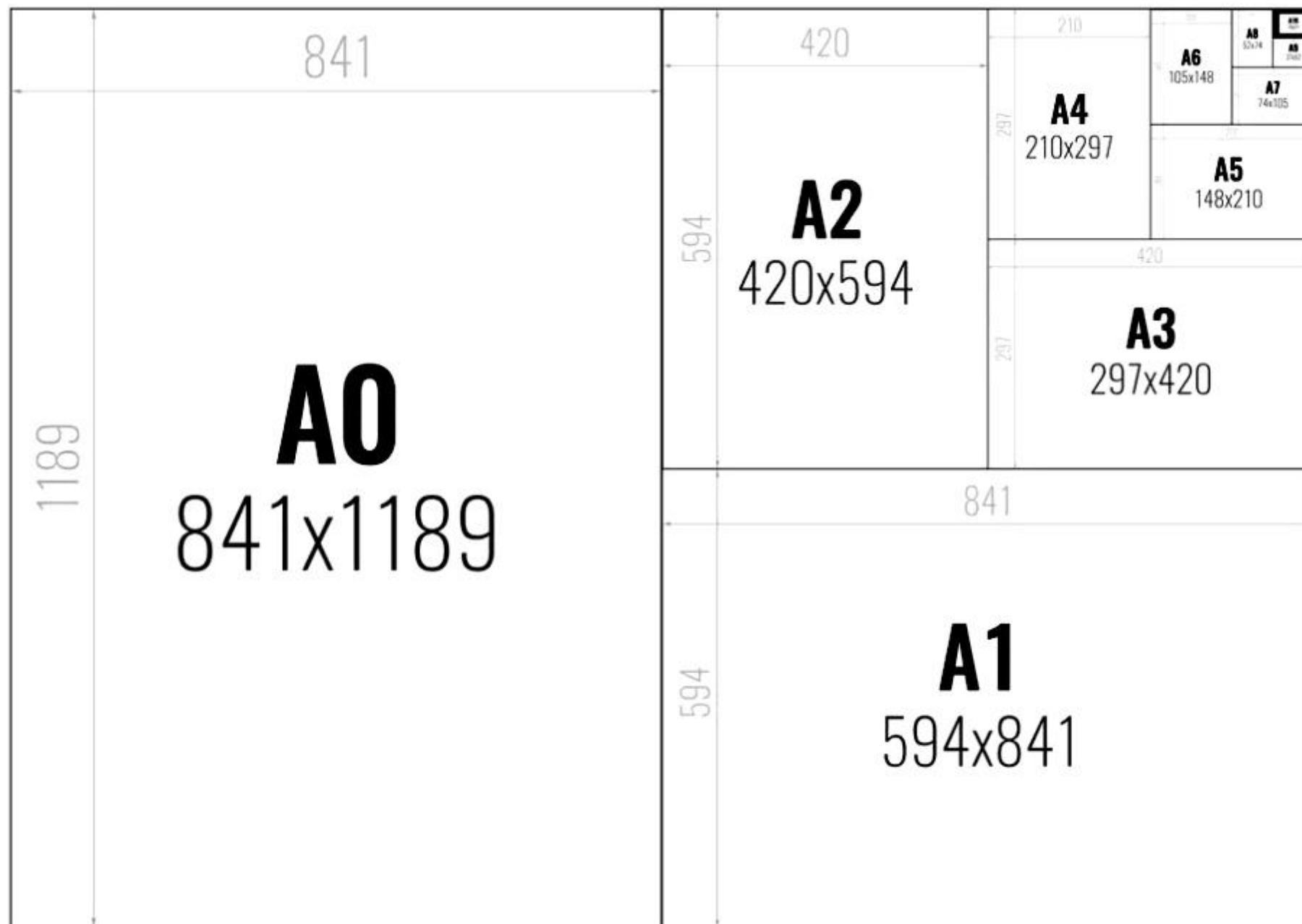
The advantages of basing a paper size on an aspect ratio of $\sqrt{2}$ was first noted in 1786 by the German scientist and philosopher Georg Christoph Lichtenberg.



Dr. Walter Porstmann (1886-1959)

$$\frac{1189}{841} = \sqrt{2}$$





Paper weights in print

Paper weight is a measurement of the density of paper products that is measured in grams per square metre (GSM).



10–35gsm
toilet paper
(and this is all it's good for)



35–55gsm
newspapers



70–100gsm
standard office paper
inside of books
magazines



110–120gsm
standard stationery
letterheads
compliment slips



130–170gsm
posters
flyers
brochures pages



170–200gsm
folded leaflets
brochure covers



200–250gsm
brochure
magazine covers
premium flyers



300–350gsm
standard business cards



400gsm
thick business cards
invitations



540gsm
luxury double thick business cards



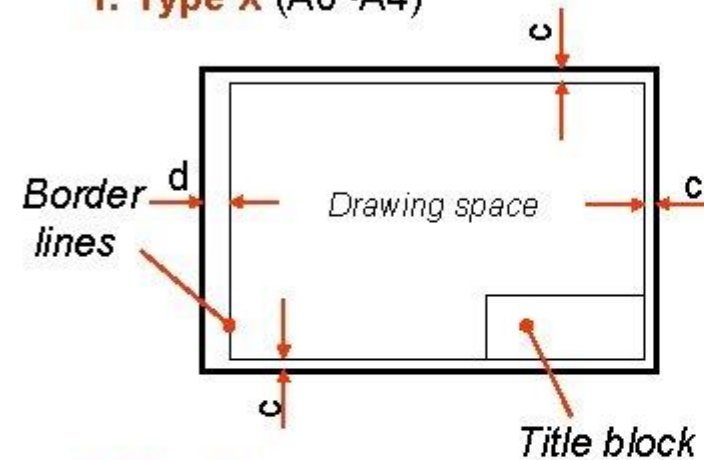
810–865gsm
luxury triple thick business cards



1080–1190gsm
luxury quadruple thick business cards

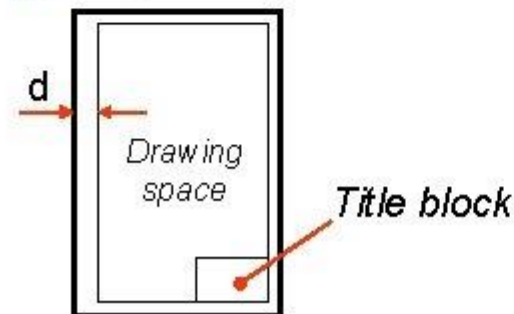
Drawing Sheet : Orientation & Margin

1. Type X (A0~A4)

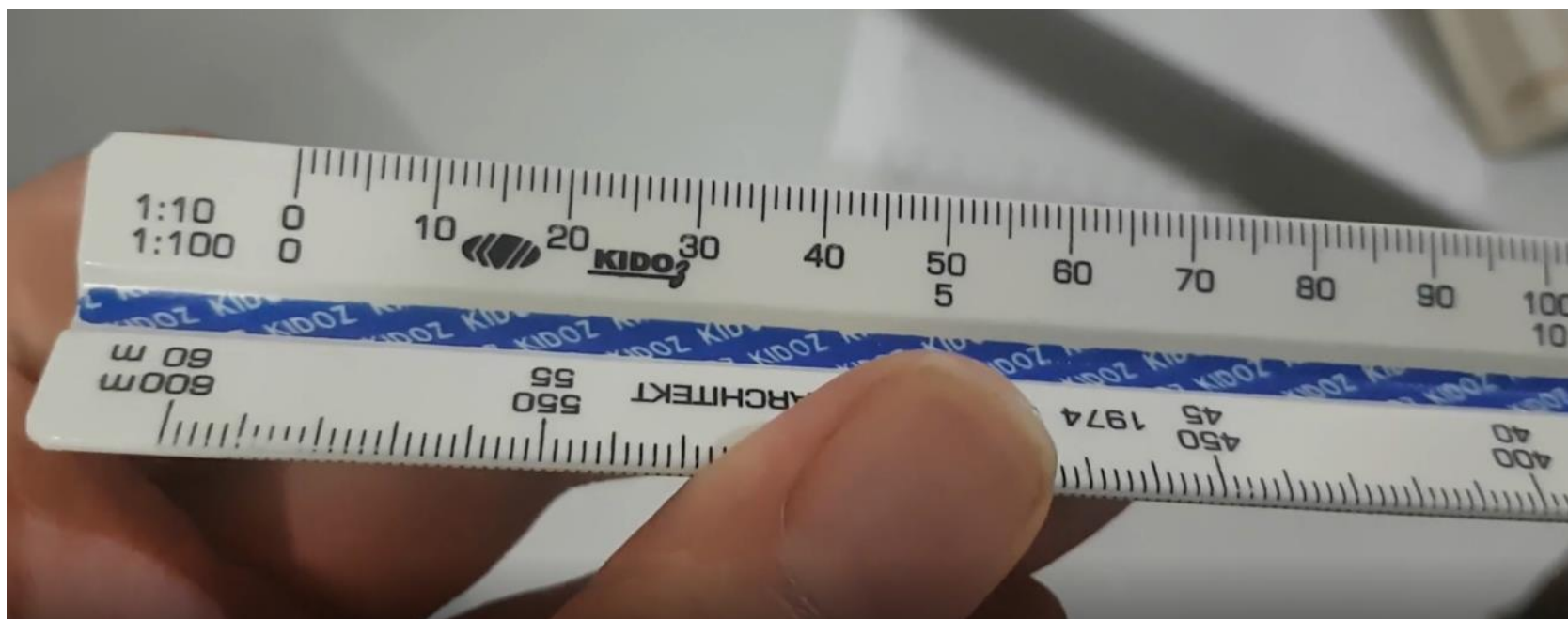
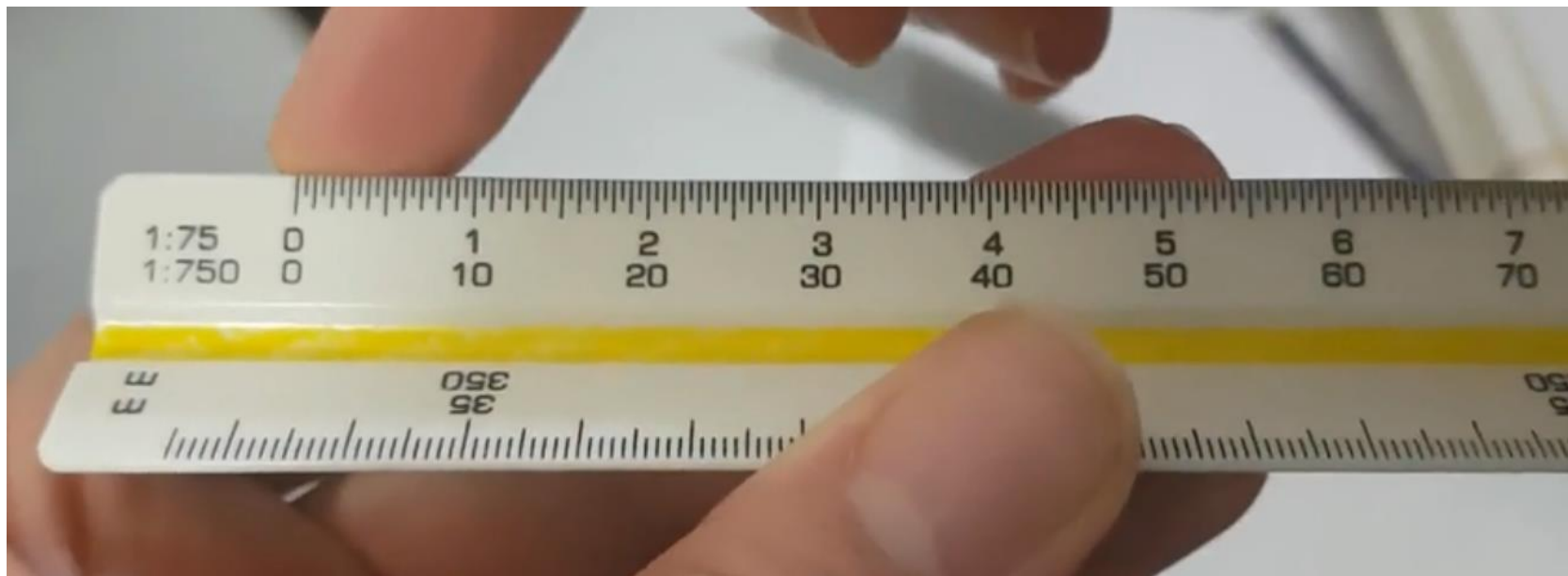


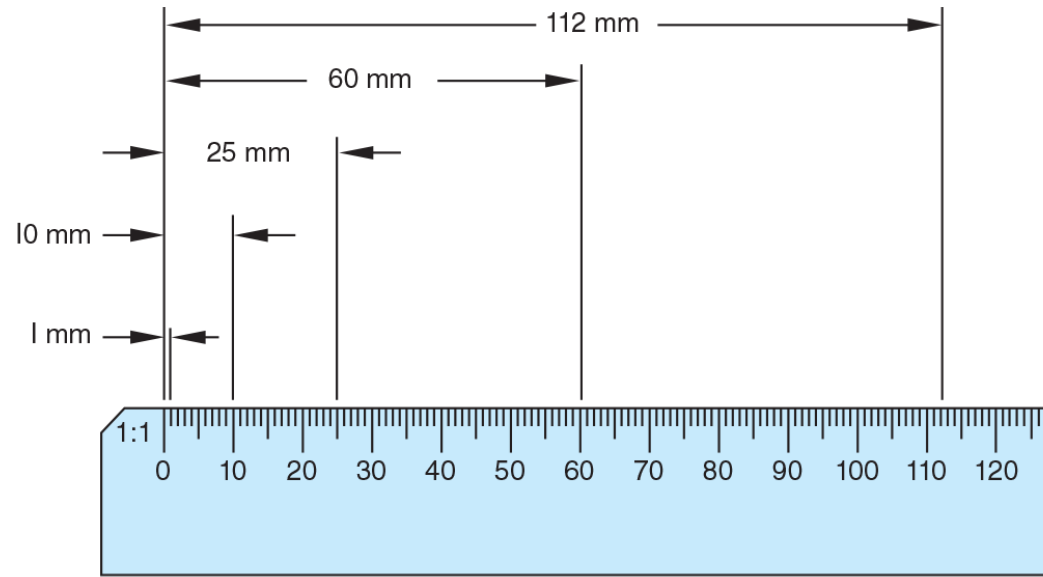
Sheet size	c (min)	d (min)
A4	10	25
A3	10	25
A2	10	25
A1	20	25
A0	20	25

2. Type Y (A4 only)

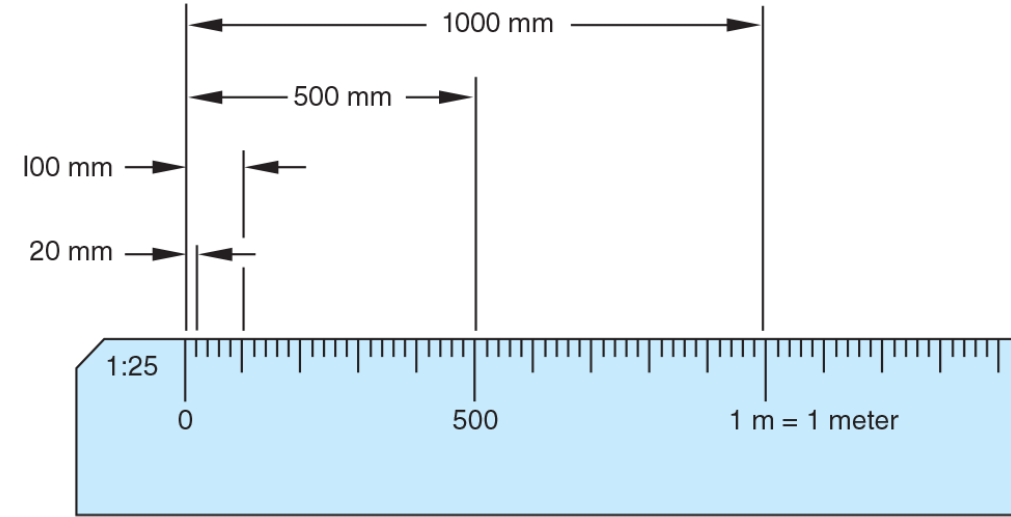


<https://slidetodoc.com/chapter-1-introduction-contents-engineering-drawing-drawing-standards/>

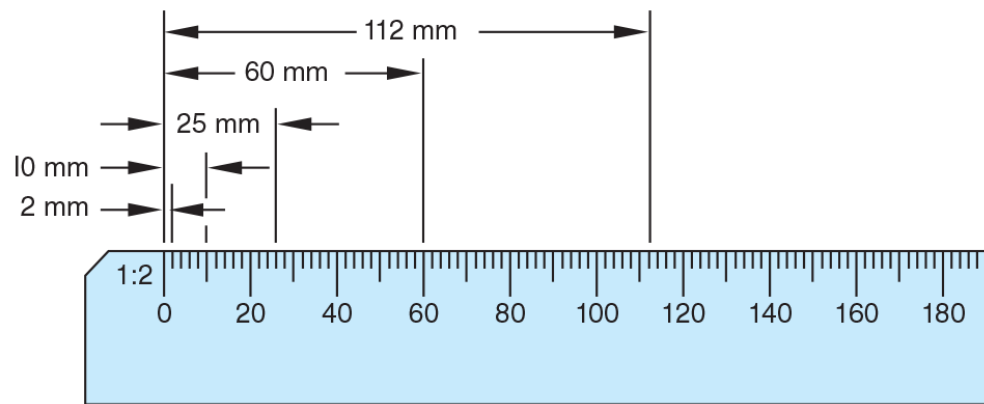




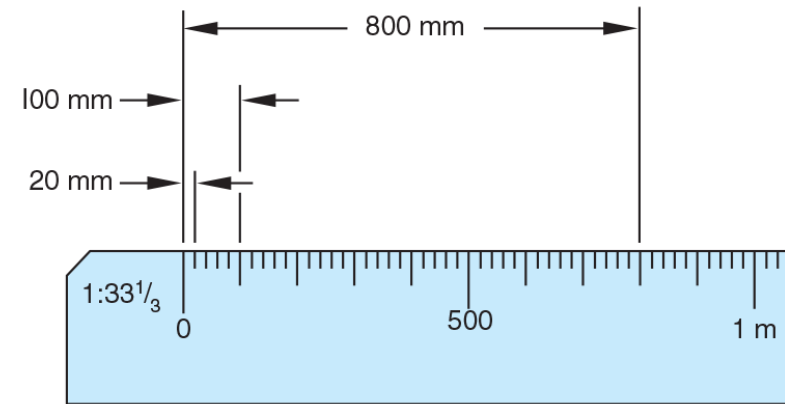
FULL SCALE = 1:1



ONE TWENTY-FIFTH SCALE = 1:25



HALF SCALE = 1:2



ONE THIRTY-THREE AND ONE-THIRD SCALE = $1:33\frac{1}{3}$

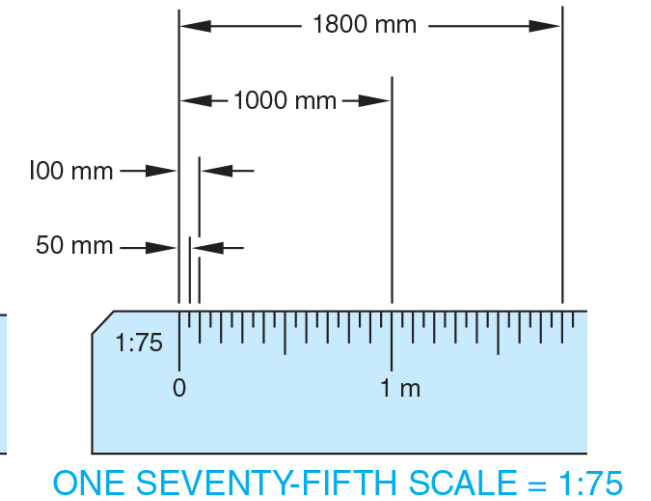
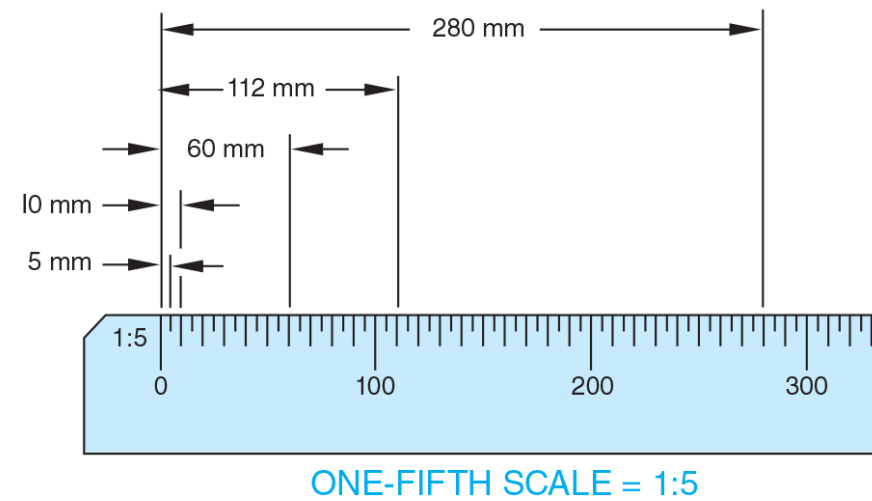
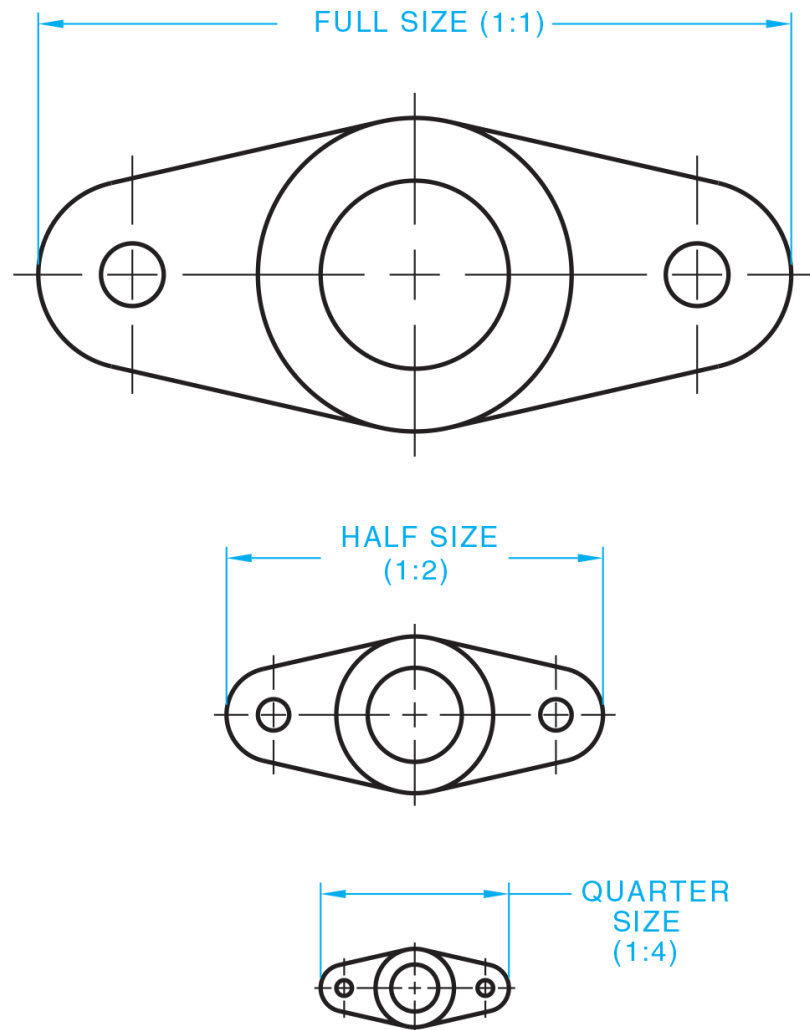


FIGURE 2.12 A sample drawing represented at full scale, halfscale, and quarterscale.